

# CALIFORNIA ENERGY DEMAND 2006-2016 STAFF ENERGY DEMAND FORECAST

## DRAFT STAFF REPORT

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# CHAPTER 1

## INTRODUCTION AND STATEWIDE FORECAST

### Introduction

This California Energy Commission (Energy Commission) staff report presents forecasts of electricity and end user natural gas consumption and peak electricity demand for the State of California and for each major utility planning area within the state for 2006-2016. In this report, staff presents forecasts of total electricity demand in geographic regions without identifying the individual load serving entities (LSEs) providing energy services to end users. The staff *California Energy Demand 2006-2016* (CED 2006) forecast supports the analysis and recommendations of the upcoming 2005 *Integrated Energy Policy Report (Energy Report)*, including electricity and natural gas system assessment and analysis of progress towards energy efficiency, demand response and renewable energy goals.

The *Energy Report* Committee will conduct a workshop on June 30, 2005, to receive public comments on this forecast and related reports<sup>1</sup>. Following the workshop, subject to the direction of the Committee, staff may prepare a final forecast or range of forecasts for adoption by the Energy Commission.

The final forecasts will be used in a number of applications. The Energy Commission will transmit the final forecast or range of forecasts to the California Public Utilities Commission (CPUC) for use in its 2006 procurement process. The CPUC has identified the Energy Report process as the appropriate venue for considering issues of load forecasting, resource assessment, and scenario analyses, to determine the appropriate level and ranges of resource needs for load serving entities in California<sup>2</sup>. The forecasts may also serve as a reference case in the CPUC's resource adequacy process for 2006. The final forecasts will also be an input to the California Independent System Operator (CAISO) controlled grid study and other transmission planning studies. The *California Gas Report* also uses Energy Commission demand and supply assessments. The final forecasts will also be used in the Energy Commission's electricity supply-demand assessment for the summer of 2006; this document does not present a new forecast for summer of 2005.

The remainder of this chapter presents an overview of the statewide forecast and the methods and assumptions used. Subsequent chapters present the forecast for each of the major electric planning areas in the state, followed by a chapter on the natural gas forecast. Table 1-1 shows the planning areas used for this forecast.

**Table 1-1: Utilities within Forecasting Areas**

<b>Planning/Service Area</b>	<b>Utilities Included</b>	
	<b>Electric Areas</b>	
Pacific Gas and Electric (PG&E)	PG&E Alameda Biggs Calaveras Gridley Healdsburg Lassen MUD Lodi Lompoc Merced Modesto	Palo Alto Plumas – Sierra Redding Roseville San Francisco Shasta Silicon Valley Tuolumne Turlock Irrigation District Ukiah USBR-CVP
Sacramento Municipal Utility District (SMUD)	SMUD	
Southern California Edison (SCE)	Anaheim Anza Azusa Banning Colton MWD	Riverside Southern California Edison Southern California Water USBR-Parker Davis Valley Electric Vernon
Los Angeles Department of Water and Power (LADWP)	LADWP	
San Diego Gas and Electric (SDG&E)	SDG&E	
Cities of Burbank, Glendale, and Pasadena (BGP)	Burbank Glendale Pasadena	
Other Planning Area (OTHER)	Pacificorp Sierra Pacific Surprise Valley	Truckee-Donner Imperial Irrigation District (IID)
Department of Water Resources (DWR)	DWR	
	<b>Natural Gas Distribution Areas</b>	
PG&E	PG&E Electric Planning Area SMUD	
SDG&E	SDG&E	
Southern California Gas Company (SCG)	SCG Long Beach	
OTHER	Avista Energy Southwest Gas Corporation	

## Statewide Forecast Results

Table 1-2 presents a comparison of staff's CED 2006 forecast with the *California Energy Demand 2003-2013* (CED 2003) final forecast used in the 2003 *Integrated Energy Policy Report* for select years. Both the CED 2006 energy consumption and peak forecasts are higher than the CED 2003 forecast over the entire forecast period, primarily because both actual peak and electricity consumption for 2003

were higher than forecasted in CED 2003. The 2003 recorded values are higher due to the recent recession being milder and shorter than assumed in the economic projections used for the CED 2003 forecast and the apparent full rebound from the voluntary conservation effects of the 2000-2001 energy crisis. In 2003, statewide electricity consumption was approximately 3 percent higher than forecasted. By 2008, the draft CED 2006 electricity consumption forecast is only about 1.5 percent higher than the CED 2003 forecast and remains at that level for the rest of the forecast period.

On the peak demand side, the 2003 non-coincident recorded peak was 3.6 percent higher than predicted, increasing to almost 5 percent higher by 2013. The primary reason for the higher difference in the peak forecast compared to the electricity consumption forecast is a reduction in the estimated peak impacts of the 2005 federal air conditioning standards compared to what was assumed in the CED 2003 forecast. While the 2005 standard's movement to Seasonal Energy Efficiency Ratio (SEER) 13 is accounted for in the energy consumption projection, some analyses have found considerable uncertainty as to whether the move to a higher SEER will actually reduce peak demand.<sup>3</sup>

**Table 1 -2: Comparison of CED 2003 and CED 2006 Forecasts  
Statewide Electricity Demand**

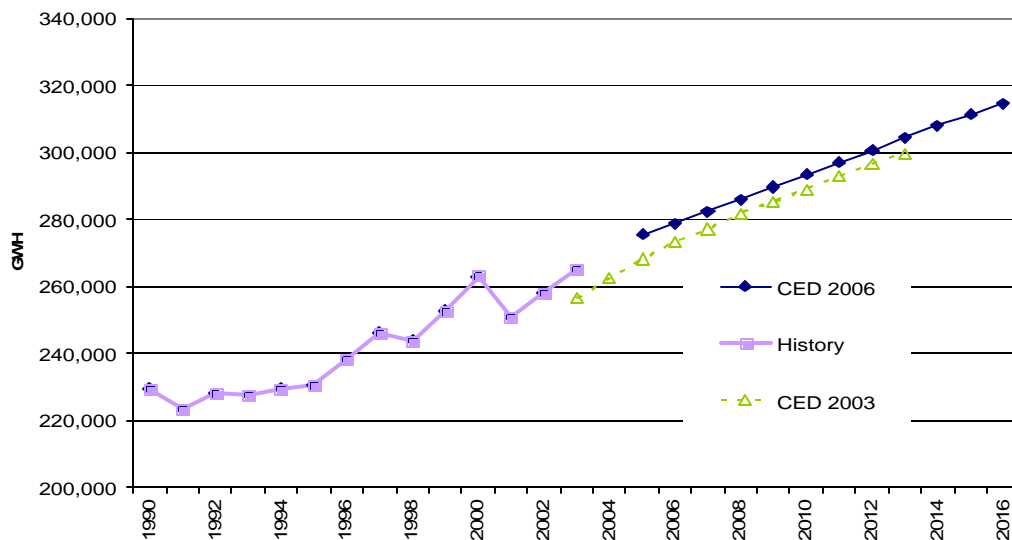
	Consumption (GWH) <sup>a</sup>				Peak (MW) <sup>b</sup>		
	CED 2003	CED 2006	%difference		CED 2003	CED 2006	%difference
1990	228,038	229,367	0.58%		46,903	46,903	0.00%
2000	263,599	262,985	-0.23%		53,754	53,754	0.00%
2003	256,476	264,824	3.25%		53,351	55,298	3.65%
2008	281,773	285,867	1.45%		58,491	60,873	4.07%
2013	299,586	304,355	1.59%		62,048	65,139	4.98%
2016	n/a	314,471			n/a	67,563	
Annual Average Growth Rates							
1990-2000	1.46%	1.38%			1.37%	1.37%	
2000-2003	-0.91%	0.23%			-0.25%	0.95%	
2003-2008	1.90%	1.54%			1.86%	1.94%	
2003-2013	1.57%	1.40%			1.52%	1.65%	
Historic values are shaded							
a) GWH=gigawatt-hour							
b) MW = megawatt							



## Annual Energy Usage

While the staff CED 2006 statewide electricity consumption forecast, shown in Figure 1-1, is higher than the CED 2003 forecast over the entire forecast period, the projected annual growth rate is lower over the forecast period. This is due to the use of a new and lower Department of Finance long term population forecast for the CED 2006 forecast, the incorporation of the effects of new building and appliance standards, increased savings from energy efficiency programs, and the removal of projected electric vehicle energy consumption which was included in the CED 2003 forecast.<sup>4</sup>

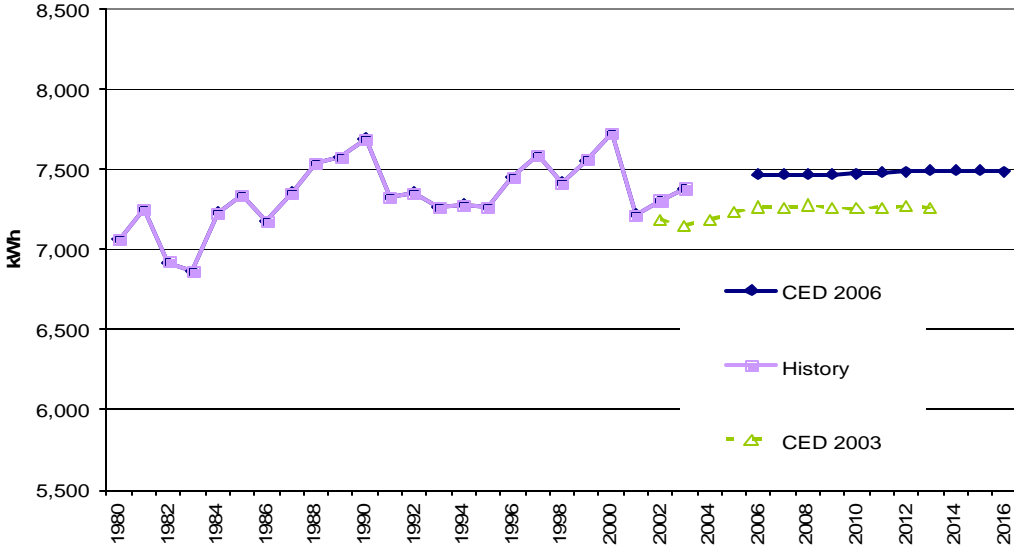
**Figure 1-1: Statewide Electricity Consumption**



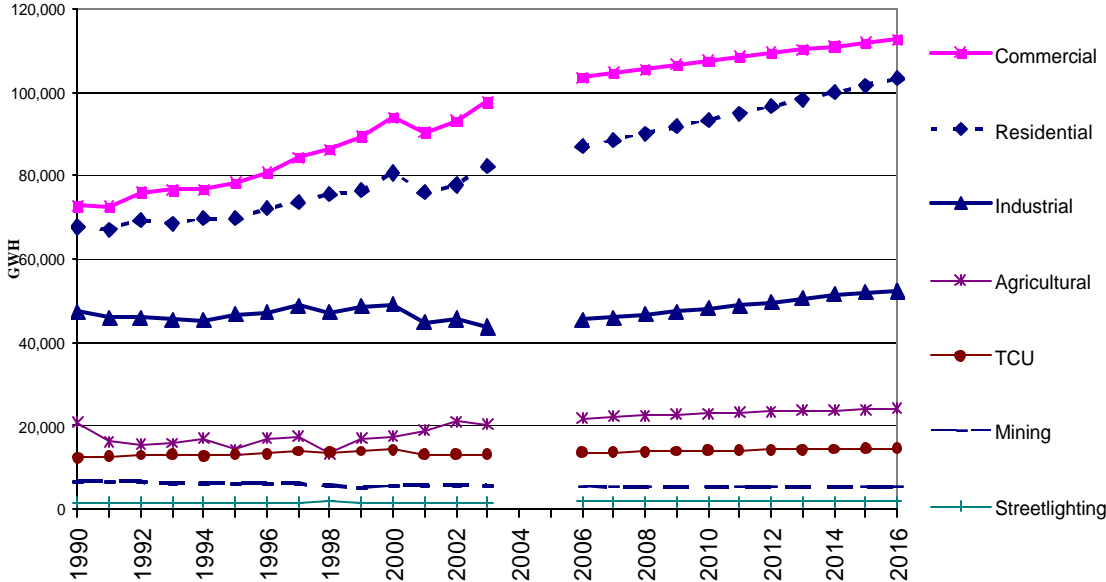
Per capita electricity consumption, shown in Figure 1-2, is projected to remain relatively constant over the forecast period at just below 7500 kilowatt-hours (kWh) per person. This is about 200 kWh higher than the final CED 2003 forecast. Over the past fifteen years per capita consumption has been relatively constant, fluctuating between 7200 and 7800 kWh per person, depending on economic conditions.

Figure 1-3 shows consumption by economic sector. Over the historic period, the commercial sector has had the highest growth followed by the residential sector. In the forecast period the residential sector continues to grow at the historic rate (1.8 percent), while the commercial sector slows to 1.1 percent annual growth. The leveling off of growth in the commercial sector is partly due to the projected impacts of recent commercial building standards.

**Figure 1-2: Statewide Electricity Consumption per Capita**



**Figure 1-3: Statewide Electricity Consumption by Sector**



To support sub-regional electricity system analysis, staff disaggregates its planning area forecasts to correspond to control areas and congestion zones. Table 1-3 shows the forecast of energy required to meet demand by control area and congestion zone. Demand is expected to grow the fastest in the newly enlarged SMUD control area, reflecting strong population growth in Sacramento, Roseville, and Redding.<sup>5</sup> In the CAISO, demand is projected to grow fastest in Southern California over the next five years.

**Table 1-3: Control Area Net Energy for Load (GWH)**

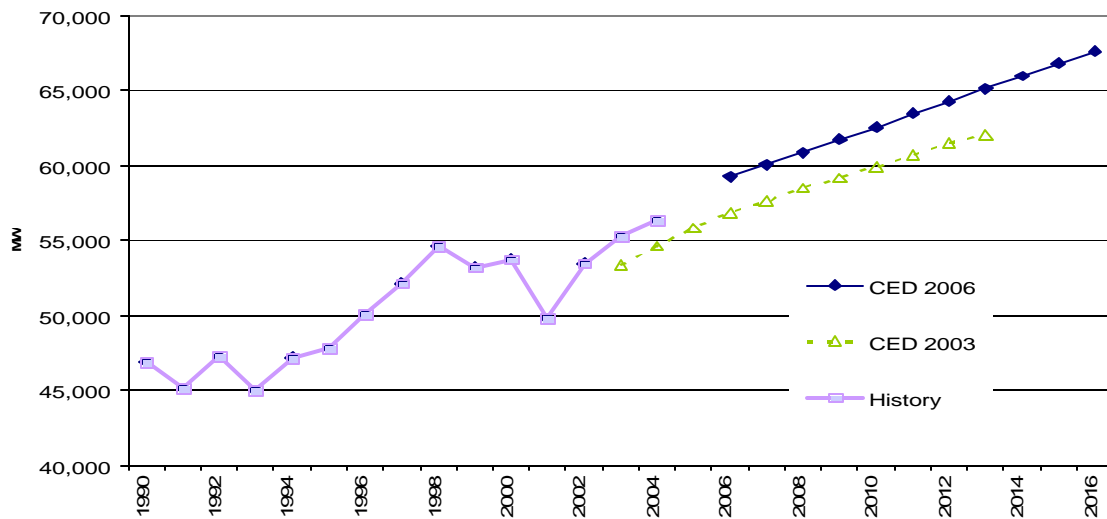
	<b>NP 15/ ZP 26</b>	<b>South of Path 15</b>	<b>Total CAISO</b>	<b>SMUD Control Area</b>	<b>LADWP Control Area</b>	<b>Total Other Areas</b>
2000	103,939	123,654	227,593	14,669	27,437	4,779
2003	103,603	122,494	226,097	15,656	28,385	5,070
2008	111,863	132,972	244,834	17,096	29,515	5,452
2016	123,948	146,714	270,662	19,927	30,204	6,008
<b>Annual Growth Rates</b>						
2000-2003	-0.1%	-0.3%	-0.2%	2.2%	1.1%	2.0%
2003-2008	1.5%	1.7%	1.6%	1.8%	0.8%	1.5%
2008-2016	1.3%	1.2%	1.3%	1.9%	0.3%	1.2%

### ***Statewide Peak Demand***

Figure 1-4 compares the new forecast of statewide non-coincident peak demand with the CED 2003 forecast. Because the peak in 2003 was almost 2,000 megawatts higher than forecast, the new forecast begins at a higher level. Over the 10-year time horizon, demand grows slightly faster than forecast in CED 2003 because staff reduced the effects of federal air conditioning standards in the forecast models.

The forecast of per capita non-coincident peak, shown in Figure 1-5, is projected to increase slightly over the forecast period from 1.54 kilowatts (kW) per person in 2003 to 1.61 in 2016. The CED 2003 forecast of per capita peak remained constant at about 1.5 kW per person throughout the forecast period. The difference in growth between the two forecasts is due to a reduction in the assumed peak impacts of the 2005 federal air conditioning appliance standards. Historic per capita peak exhibits greater variation than does annual electricity consumption due to the greater impact of temperature variation on peak demand.

**Figure 1-4: Statewide Non-Coincident Peak Demand**



**Figure 1-5: Statewide Non-Coincident Peak Demand per Capita**

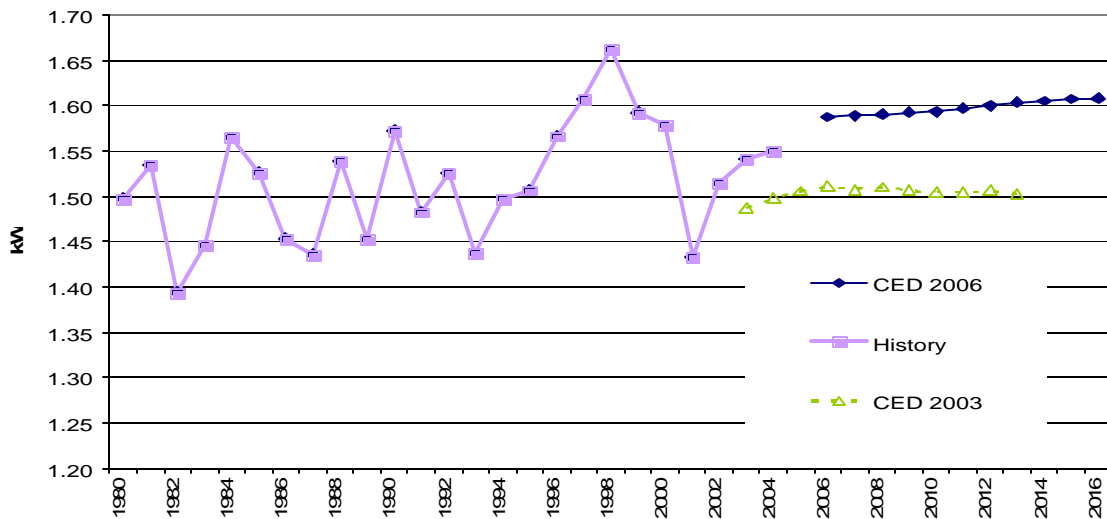


Figure 1-6 shows peak demand by the major economic sectors. As in the consumption forecast, residential demand grows fastest, at 2 percent annually. Commercial sector peak demand, slowed by lighting standards, grows at less than 1 percent. Industrial peak demand grows at 1.4 percent annually, about the same as industrial energy growth.

**Figure 1-6: Statewide Peak Demand by Sector (MW)**

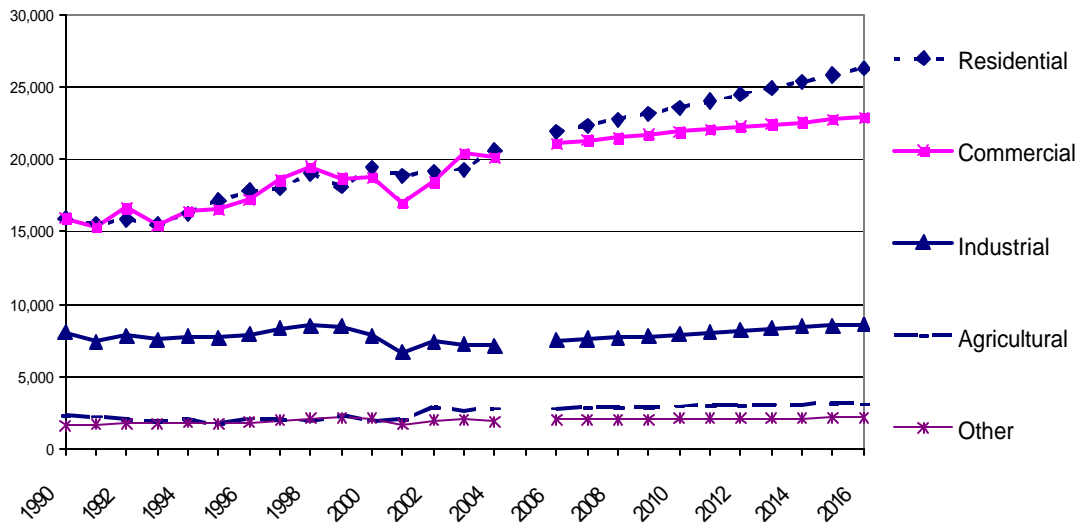


Table 1-4 shows peak demand by control area. As in the energy forecast, the SMUD area grows the fastest, with demand increasing by almost 1,100 MW by 2016. The South of Path 15 zone of the CAISO is forecasted to add 6,000 MW of load by the end of the forecast.

**Table 1-4: Annual Peak Demand (MW)  
By Control Area and Congestion Zone**

	NP 15/ ZP 26	South of Path 15	Total CAISO	SMUD Control Area	LADWP Control Area	Total Other Areas	Total State
2000	20,563	23,373	43,937	2,928	5,864	1,025	53,754
2003	20,088	24,610	44,698	3,538	5,918	1,144	55,298
2008	21,912	27,586	49,498	3,887	6,257	1,230	60,873
2016	24,417	30,703	55,120	4,707	6,379	1,357	67,563
<b>Annual Growth Rates</b>							
2000-2003	-0.78%	1.73%	0.57%	6.51%	0.31%	3.71%	0.95%
2003-2008	1.75%	2.31%	2.06%	1.90%	1.12%	1.47%	1.94%
2008-2016	1.36%	1.35%	1.35%	2.42%	0.24%	1.23%	1.31%
2003-2016	1.51%	1.72%	1.63%	2.22%	0.58%	1.32%	1.55%

## ***Overview of Methods and Assumptions***

The CED 2006 forecast is the product of essentially the same methods used to prepare earlier long term staff demand forecasts. Models for the major economic sectors produce forecasts of annual energy consumption in each utility planning area. After adjusting for historic weather and usage, the annual consumption forecast is used to forecast annual peak demand.

The commercial, residential, and industrial sector energy models are structural models that attempt to explain how energy is used by process and end use. Structural models are critical to enable forecasts to account for the impacts of mandatory energy efficiency standards and other energy efficiency programs that seek to force or encourage adoption of more efficient technologies by end users. This is especially true in the context of the major emphasis upon energy efficiency in California.

Some of the methods that translate primary economic and demographic variables into sector-specific drivers were updated for this forecast. Additional historic data allows different periods to be used in preparing parameter estimates and in calibrating the results of the backcasts to recorded data. The degradation of the quality of the historic consumption data reported by LSEs through the Quarterly Fuel and Energy Reporting regulations has introduced some uncertainty about the allocation of energy between economic sectors, leading to some differences in customer sector-specific forecasts in this cycle compared to earlier ones.

A more detailed presentation of forecast methods will be available in the *Methodology Report*.

## ***Economic and Demographic Assumptions***

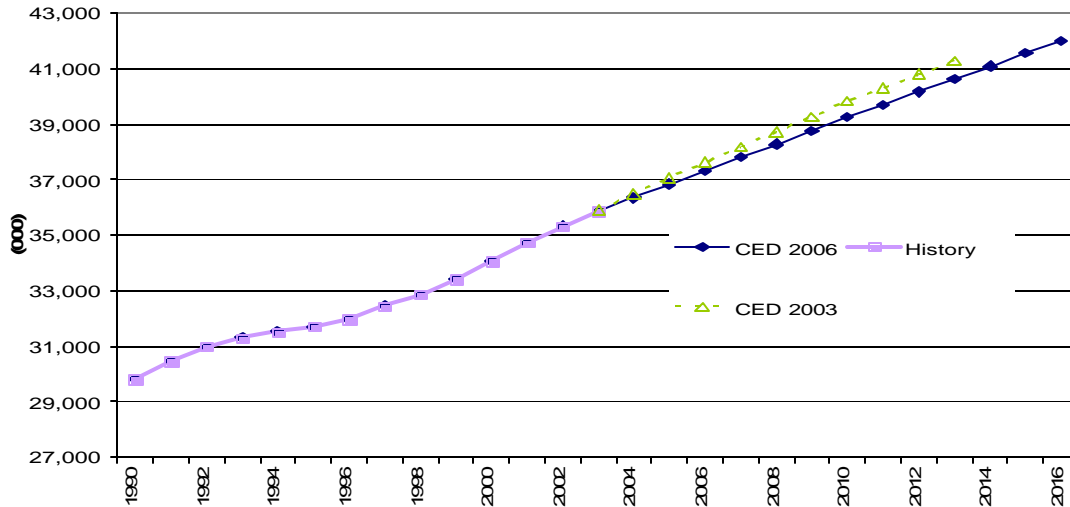
Population growth is a key driver for residential energy demand, as well as commercial growth and demand for water pumping and other services. The draft CED 2006 forecast uses the May 2004 P-1 long-term population forecast made by the California Department of Finance (DOF).<sup>6</sup> The population forecast used in the CED 2003 forecast was the previous long-term DOF forecast made in 1998.

Figure 1-7 compares these two population projections. DOF's new forecast is lower than the previous one due to lower immigration and fertility assumptions. As a result, population is projected to grow at about 1.2 percent annually, compared to 1.4 percent in the previous projections. By comparison, statewide population grew an average of 1.3 percent annually from 1990 to 2000.

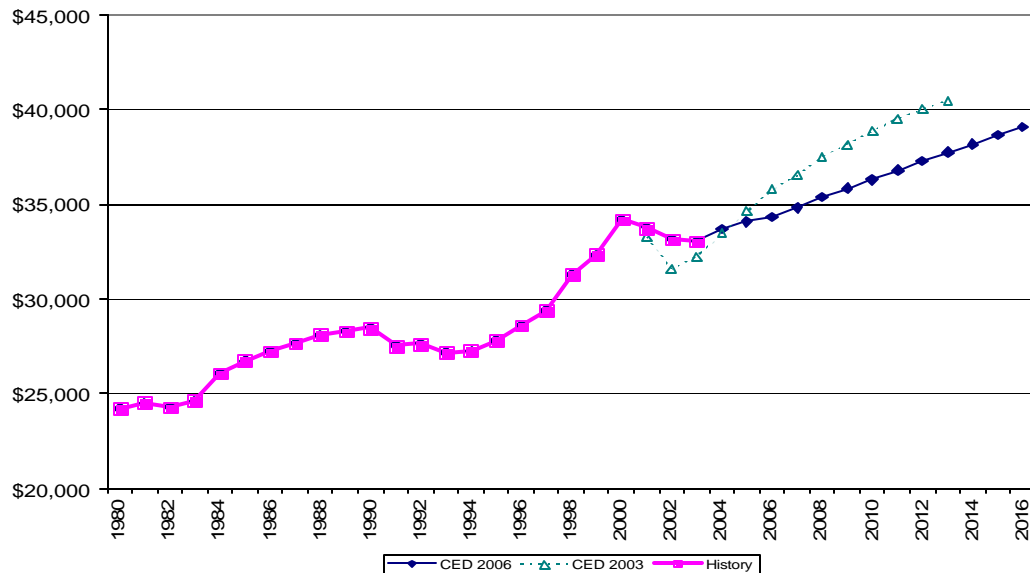
Figure 1-8 presents a comparison of statewide per capita income. The CED 2003 forecast projected a greater decline in personal income due to the 2001 recession than actually occurred and also anticipated a greater recovery than is projected in the CED 2006 forecast (a less severe drop off suggests a less vigorous rebound). The CED 2003 forecast was based on the September 2002, UCLA Anderson School of Business forecast, while the CED 2006 forecast is based on the December 2004 Economy.com forecast. Staff is now using the Economy.com economic forecast because this forecast provides county-level projections that are not available from

the UCLA forecast model. Regional differences in economic growth are important for the numerous planning applications of these demand forecasts.

**Figure 1-7: Total Statewide Population**



**Figure 1-8: Per Capita Income (\$2003)**



## ***Programmatic Assumptions***

### **Investor Owned Utility Energy Efficiency Goals**

In decision D.04-09-060, the CPUC established numerical goals for electricity and natural gas savings for the IOUs for the period 2004-2013.<sup>7</sup> D.04-09-060 implements a core component of the Energy Action Plan (EAP), which was earlier adopted by the CPUC, the California Energy Commission and the California Consumer Power and Conservation Financing Authority. The decision translated that mandate into explicit, numerical goals for reducing electricity and natural gas consumption as well as peak demand. Savings from energy efficiency programs funded by the public goods charge and procurement rates will contribute to these goals, including those achieved through the Low-Income Efficiency Program.

The decision requires incorporation of the most recently adopted energy savings goals into procurement plan cycles. This is reinforced in D.04-12-048, which requires the IOUs to meet or exceed the CPUC's efficiency goals over the next 10 years and specifically over the next energy efficiency funding cycle (2006-2008). As the goals are updated, IOUs are to incorporate the most recently adopted goals into their procurement plans.

Because the post-2008 goals are subject to change, only impacts of the energy efficiency goals through 2008 are accounted for in this forecast. The electricity program savings goals used for each IOU are shown in Table 1-5. To account for these goals in the forecast, staff assumed each IOU's current mix of programs continued, adjusting the funding level to achieve the goals. The resulting forecast of efficiency impacts was then used to adjust the raw residential and commercial demand forecasts.

**Table 1-5**

<b>First Year Impacts of 2004-2008 Energy Efficiency Goals</b>						
	<b>PG&amp;E</b>		<b>SCE</b>		<b>SDG&amp;E</b>	
	Gwh	MW	Gwh	MW	Gwh	MW
2004	744	161	826	179	268	58
2005	744	161	826	179	268	58
2006	829	180	922	200	281	61
2007	944	205	1046	227	285	62
2008	1053	229	1167	253	284	62

### **Demand Response**

The term "demand response" encompasses a variety of programs, including traditional direct control (interruptible) programs and new price-responsive demand programs. A key distinction is whether the program is dispatchable. Dispatchable programs, such as direct control, interruptible tariffs, or demand bidding programs, have triggering conditions that are not under the control of and cannot be anticipated



by the customer. Energy or peak load saved from dispatchable programs is treated as a resource, and therefore not accounted for in the demand forecast. Nondispatchable programs are not activated using a predetermined threshold condition but allow the customer to make the economic choice whether to modify usage in response to ongoing price signals. Impacts from committed nondispatchable programs should be included in the demand forecast.

At this time, all of the existing demand response programs have some form of triggering condition. Although the utility or CAISO may not have direct control, the customer only has the opportunity to participate in the program when the program operator has called an event, either because of high market prices or resource scarcity. Therefore, in this forecast, no demand response impacts are counted on the demand side.

### **Self-Generation**

Assembly Bill 970 required the CPUC to initiate load control and distributed generation program activities designed to produce significant public benefits. In response, on March 27, 2001, the CPUC issued Decision 01-03-073 (D.01-03-073) mandating a self-generation program in the service territories of California's investor-owned utilities. The California Self-Generation Incentive Program (SGIP) offers financial incentives to customers of IOUs who install certain types of distributed generation facilities to meet all or a portion of their energy needs. The program began in mid-2001 and is scheduled to continue offering incentives for completed projects through the end of 2007.

To forecast future self-generation load, staff used the IOU reports on completed new interconnections and pending applications to develop projections of capacity additions of new interconnections.<sup>8</sup> It is assumed that new additions will continue at the current rate through the life of the SGIP program. After 2007, self-generated loads are assumed to grow at the rate of the utilities' noncommercial sector.

The interconnection reports provide a detailed picture of capacity addition trends. To translate self-generation capacity into effects on system peak demand requires assumptions about load shape, the coincidence of self-generation peak with system peak, and the extent to which self-generation units are operating during peak hours. Staff used the results of the 2004 evaluation of the SGIP program for these assumptions.<sup>9</sup> For example, this study found that the load impact at the time of the 2004 CAISO peak was 58 MW, out of 103 MW of installed capacity.

Table 1-6 shows the resulting forecast. Demand met by self-generation is forecasted to grow almost twice as fast as in the CED 2003 forecast. The change in historical consumption reflects a change in data reporting requirements.<sup>10</sup> The CED 2006 forecast uses historic usage reported by individual self-generators, while CED 2003 used estimates provided by the IOUs, which were generally higher. Staff does not have a reliable data source for historic self-generated peak. The CED 2006 historic peak data assumes a common load factor of 0.68, consistent with that assumed in the forecast.

**Table 1 -6: Self-Generation Demand Forecast**

	Consumption (GWH)				Demand at System Peak (MW)		
	CED 2003	CED 2005	%difference		CED 2003	CED 2005	%difference
1990	8,784	8,784	0.00%		1,141	1,475	29.24%
2000	11,135	9,998	-10.21%		1,688	1,678	-0.56%
2003	12,337	11,133	-9.76%		1,867	1,869	0.12%
2008	12,878	12,148	-5.67%		1,951	2,039	4.51%
2013	13,447	12,806	-4.76%		2,040	2,150	5.38%
2016	n/a	13,123			n/a	2,203	
Annual Average Growth Rates							
1990-2000	2.40%	1.30%			3.99%	1.30%	
2000-2003	3.48%	3.65%			3.41%	3.65%	
2003-2008	0.86%	1.76%			0.89%	1.76%	
2003-2013	0.87%	1.41%			0.89%	1.41%	
Historic values are shaded							

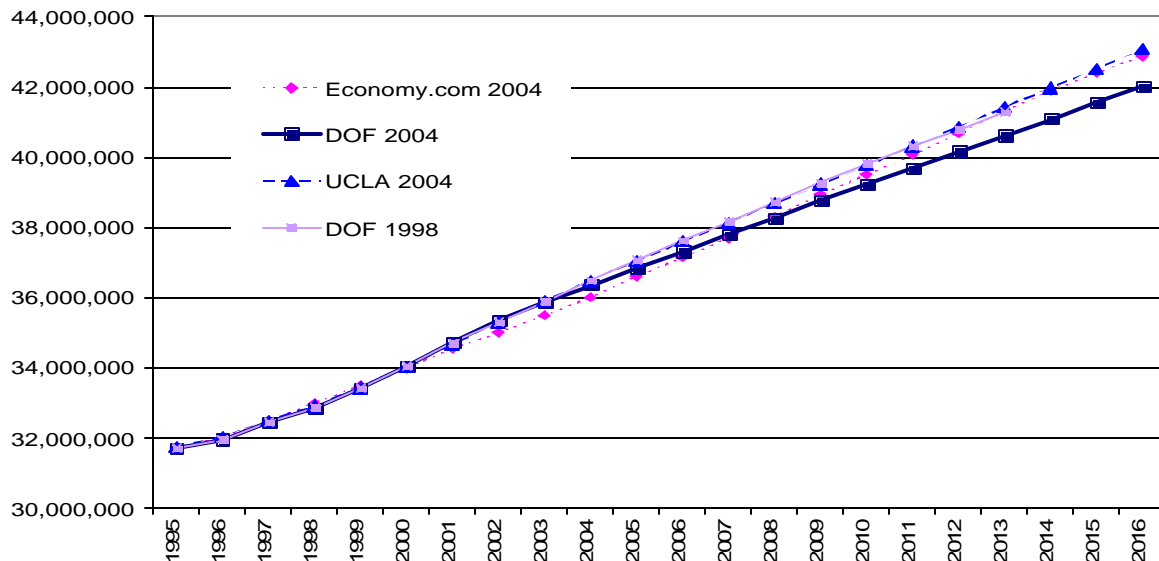
### ***Forecast Uncertainty***

There are many issues regarding uncertainty of the current 2006-2016 forecast, (for example future economic conditions, energy prices, changing weather patterns) but the two major sources of uncertainty center on population projections and the accuracy of recent historic electricity consumption reporting. The first affects both peak and energy similarly, while the later has uncertain impacts that could differ between peak and energy consumption.

### **Population Projections**

Staff has used the May 2004 DOF P-1 long term population projections for the demographic basis of the CED 2006-2016 forecast. The May 2004 population forecast is somewhat lower (600,000 persons in 2013) than the 1998 DOF long term population projections that were used in the CED 2003 forecast due to lower migration and fertility assumptions. Figure 1-9 presents a comparison of the two DOF statewide total population forecasts as well as the September 2004 UCLA Anderson School of Business and the October 2004 economy.com forecast (which is based on the Census Bureau population projections). Of the four forecasts, the May DOF forecast has the lowest population projections throughout the forecast period. Differences between the DOF forecast and the other forecasts are greater at the regional level and will be discussed in the specific planning area chapters.

**Figure 1-9: Statewide Population Forecast Comparison**



### Historic Electricity Consumption Estimates

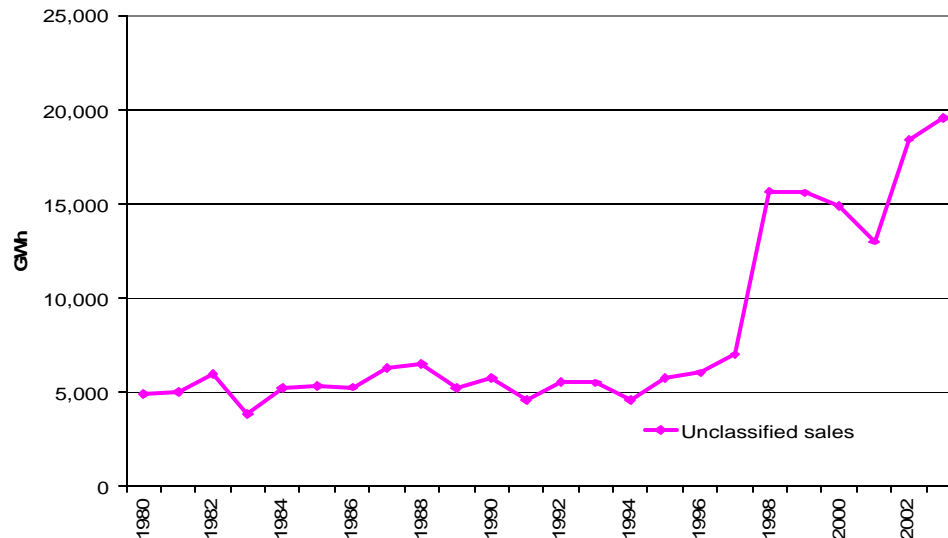
Energy Commission demand forecasting models are organized by sector according to economic activity (that is, commercial, industrial, agricultural, etc.). Each of these forecasting models develops a forecast based on sub-activities within the sector (such as commercial building type or industrial activity). Under the Energy Commission's Quarterly Fuel and Energy Reporting regulations, each LSE is required to file monthly and annual reports that document energy consumption by activity group. In the past this reporting was to conform to the Standard Industrial Classification (SIC) system. More recently this system was revised to the North American Industrial Classification System (NAICS)<sup>11</sup>. The switch to NAICS has caused some difficulty in identifying the appropriate economic classification of many energy users. The result of this change, along with the lack of reporting regulation adherence by various LSEs, is a lower quality of the Energy Commission's historical record of sector specific consumption. Unclassified sales — consumption which the LSE has not identified by a NAICS category and that staff therefore cannot map to a customer sector — is now the fastest growing category of consumption reported to the Energy Commission.

Figure 1-10 shows the total statewide pattern of unclassified sales from 1980 to 2003. The largest increase coincided with the advent of the restructured electric industry. Under current reporting requirements, the IOUs are required to identify the economic classification of direct access customers and provide that information to the direct access provider. Much of the increase in unclassified is in direct access customers identified by the IOUs as unclassified.

This electricity has been allocated to economic sectors using professional judgment by staff, but this is a problem that needs to be corrected in the near future for the forecasting process to be once more a reliable tool for planning or policy analysis. If

staff does not know more precisely how much electricity each economic sector is really using, staff cannot correctly quantify the effects of energy efficiency programs or standards on demand or apply the correct load shapes for forecasting peak. The forecast may be overestimating or underestimating demand growth, depending on the true distribution of unclassified sales.

**Figure 1-10: Total Statewide Unclassified Sales**



<sup>1</sup> The Forecast Comparison Report will present a comparison of the staff forecast with the forecasts submitted to the Energy Commission by load serving entities (LSEs) earlier this year. The Methodology Report will document in more detail the methods and assumptions used in the Energy Commission's demand forecasting models. These reports and supporting tables will be posted on the Energy Commission website at: <http://www.energy.ca.gov/energypolicy/index.html>.

<sup>2</sup> Peevey, Assigned Commissioner's Ruling on Interaction Between the CPUC Long-Term Planning Process and the California Energy Commission Integrated Energy Policy Report Process, September 9, 2004 Rulemaking 04-04-003.

<sup>3</sup> "EER and SEER as Predictors of Seasonal Cooling Performance," Southern California Edison, December 15, 2003.

<sup>4</sup> In March 2003, the California Air Resources Board (CARB) ended its Zero Emission Vehicle program.

<sup>5</sup> The definition of the SMUD Control Area does not include annexation of those portions of Yolo County that have requested it.

<sup>6</sup> State of California, Department of Finance, Population Projections by Race/Ethnicity for California and Its Counties 2000–2050, Sacramento, California, May 2004.

<sup>7</sup> Interim Opinion: Energy Savings Goals for Program Year 2006 and Beyond, D. 04-09-040, September 23, 2004, in Energy Efficiency Rulemaking 01-08-028.

<sup>8</sup> Rule 21 Statistics - Approved and Pending , [http://www.energy.ca.gov/distgen/interconnection/rule21\\_stats.html](http://www.energy.ca.gov/distgen/interconnection/rule21_stats.html)

<sup>9</sup> CPUC Self-Generation Incentive Program Fourth-Year Impact Report Final Report, ITRON, Submitted to Southern California Edison and The Self-Generation Incentive Program Working Group, April 15, 2005.

<sup>10</sup> Beginning in 1990 all self-generators with peak demand above 10 megawatts reported their energy consumption, but staff continued to use estimates provided by the IOUs of planning area self-generation. Since 2001, all self-generators with annual peak demand greater than one megawatt report their annual energy usage to the Energy Commission.

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<sup>11</sup> As a result of NAFTA, the federal government replaced the SIC system with the NAICS system. In turn, the Energy Commission modified its regulations requiring utilities to classify all end users from SIC to NAICS to allow economic data to be matched to utility consumption data.

**Form 1.1a - Statewide  
California Energy Demand 2006-2016 Staff Forecast  
Electricity Consumption by Sector (GWh)**

	Residential	Commercial	Industrial	Mining	Agricultural	TCU	Streetlighting	Total Consumption
1980	52,082	47,600	40,771	4,104	13,737	7,956	1,685	167,935
1981	53,495	50,419	41,350	4,387	16,402	8,260	1,643	175,957
1982	52,574	50,297	37,784	6,061	14,507	8,759	1,706	171,688
1983	54,577	52,023	38,624	6,322	11,610	9,135	1,604	173,896
1984	57,564	55,092	40,411	6,978	15,320	9,766	1,535	186,666
1985	58,528	56,908	41,496	7,329	17,453	10,423	1,537	193,673
1986	58,452	59,306	42,232	6,514	15,940	10,084	1,512	194,038
1987	61,267	62,949	44,182	6,463	16,409	11,058	1,536	203,865
1988	64,033	65,958	46,421	6,535	17,995	11,465	1,486	213,894
1989	65,316	68,932	46,942	6,719	19,225	12,087	1,499	220,720
1990	67,667	72,753	47,384	6,786	20,774	12,430	1,572	229,367
1991	67,142	72,540	46,004	6,835	16,266	12,640	1,606	223,032
1992	69,225	76,018	45,928	6,600	15,471	12,967	1,644	227,854
1993	68,424	76,604	45,532	6,262	15,902	13,059	1,640	227,423
1994	69,774	76,687	45,388	6,160	16,948	12,842	1,641	229,440
1995	69,770	78,409	46,834	6,148	14,301	13,238	1,616	230,315
1996	72,164	80,709	47,207	6,202	16,874	13,293	1,652	238,100
1997	73,547	84,442	48,847	6,174	17,514	13,914	1,693	246,132
1998	75,387	86,330	47,294	5,794	13,485	13,608	1,750	243,649
1999	76,482	89,466	48,695	5,233	17,097	13,921	1,650	252,544
2000	80,612	93,978	49,160	5,675	17,497	14,343	1,721	262,985
2001	75,916	90,405	44,850	5,786	18,921	13,103	1,713	250,693
2002	77,740	93,109	45,637	5,724	21,057	13,177	1,700	258,144
2003	82,257	97,665	43,706	5,946	20,274	13,245	1,732	264,824
2006	87,005	103,479	45,504	5,579	21,853	13,600	1,764	278,784
2007	88,505	104,675	46,015	5,491	22,149	13,714	1,775	282,324
2008	90,119	105,547	46,727	5,451	22,409	13,827	1,786	285,867
2009	91,705	106,573	47,432	5,444	22,681	13,938	1,795	289,568
2010	93,288	107,500	27,614	5,452	22,958	14,047	1,804	272,664
2011	94,921	108,551	48,865	5,462	23,215	14,148	1,814	296,976
2012	96,590	109,392	49,657	5,471	23,432	14,246	1,823	300,612
2013	98,250	110,236	50,546	5,484	23,665	14,343	1,831	304,355
2014	99,913	110,959	51,409	5,503	23,823	14,438	1,840	307,885
2015	101,644	111,875	51,945	5,477	24,030	14,532	1,848	311,352
2016	103,363	112,665	52,307	5,434	24,223	14,623	1,857	314,471

**Annual Growth Rates (%)**

1980-1990	2.7	4.3	1.5	5.2	4.2	4.6	-0.7	3.2
1990-2000	1.8	2.6	0.4	-1.8	-1.7	1.4	0.9	1.4
2000-2003	0.7	1.3	-3.8	1.6	5.0	-2.6	0.2	0.2
2003-2008	1.8	1.6	1.3	-1.7	2.0	0.9	0.6	1.5
2008-2016	1.7	0.8	1.4	0.0	1.0	0.7	0.5	1.2
2003-2016	1.8	1.1	1.4	-0.7	1.4	0.8	0.5	1.3

**Form 1.1b - Statewide  
California Energy Demand 2006-2016 Staff Forecast  
Electricity Sales by Sector (GWh)**

	Residential	Commercial	Industrial	Mining	Agricultural	TCU	Streetlighting	Total Consumption
1980	52,082	47,600	40,140	4,104	13,737	7,956	1,685	167,303
1981	53,495	50,419	40,713	4,387	16,402	8,260	1,643	175,319
1982	52,574	50,283	37,080	6,040	14,507	8,759	1,706	170,949
1983	54,577	51,976	37,532	6,240	11,607	9,132	1,604	172,668
1984	57,564	55,020	39,265	6,885	15,317	9,723	1,535	185,310
1985	58,528	56,751	40,297	7,220	17,447	10,303	1,537	192,082
1986	58,450	59,102	40,647	6,115	15,932	9,865	1,512	191,622
1987	61,263	62,628	41,772	5,824	16,402	10,763	1,536	200,188
1988	64,028	65,436	43,411	5,772	17,987	11,127	1,486	209,248
1989	65,310	68,402	43,683	5,631	19,217	11,721	1,499	215,463
1990	67,661	72,200	44,051	5,613	20,766	12,028	1,572	223,891
1991	67,135	71,952	42,720	5,581	16,257	12,225	1,606	217,475
1992	69,219	75,438	42,743	5,339	15,461	12,579	1,644	222,422
1993	68,417	75,997	41,511	4,988	15,899	12,673	1,640	221,124
1994	69,774	75,856	41,100	4,760	16,946	12,453	1,641	222,529
1995	69,770	77,541	42,537	4,748	14,298	12,827	1,616	223,337
1996	72,164	79,894	42,381	4,802	16,871	13,013	1,652	230,776
1997	73,546	83,608	44,114	4,701	17,512	13,639	1,693	238,814
1998	75,387	85,501	42,934	4,311	13,482	13,396	1,750	236,762
1999	76,482	88,636	44,303	3,957	17,097	13,741	1,650	245,866
2000	80,612	93,161	45,209	4,396	17,497	14,167	1,721	256,763
2001	75,916	89,888	41,095	4,702	18,921	12,850	1,713	245,085
2002	77,740	92,511	41,620	4,600	21,057	13,060	1,700	252,288
2003	82,257	97,022	39,282	4,783	20,274	13,203	1,732	258,554
2006	87,005	102,616	37,494	2,994	21,853	13,229	1,764	266,954
2007	88,505	103,794	37,875	2,862	22,149	13,336	1,775	270,295
2008	90,119	104,658	38,508	2,793	22,409	13,445	1,786	273,718
2009	91,705	105,676	39,126	2,754	22,681	13,551	1,795	277,286
2010	93,288	106,594	39,771	2,731	22,958	13,656	1,804	280,802
2011	94,921	107,637	40,381	2,708	23,215	13,752	1,814	284,427
2012	96,590	108,470	41,091	2,687	23,432	13,846	1,823	287,938
2013	98,250	109,306	41,891	2,668	23,665	13,938	1,831	291,548
2014	99,913	110,022	42,677	2,658	23,823	14,029	1,840	294,961
2015	101,644	110,931	43,140	2,605	24,030	14,118	1,848	298,317
2016	103,363	111,715	43,444	2,541	24,223	14,207	1,857	301,348

**Annual Growth Rates (%)**

1980-1990	2.7	4.3	0.9	3.2	4.2	4.2	-0.7	3.0
1990-2000	1.8	2.6	0.3	-2.4	-1.7	1.7	0.9	1.4
2000-2003	0.7	1.4	-4.6	2.8	5.0	-2.3	0.2	0.2
2003-2008	1.8	1.5	-0.4	-10.2	2.0	0.4	0.6	1.1
2008-2016	1.7	0.8	1.5	-1.2	1.0	0.7	0.5	1.2
2003-2016	1.8	1.1	0.8	-4.8	1.4	0.6	0.5	1.2

**Form 1.c - Statewide**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Retail Sales by Utility (GWh)**

Year	PG&E Planning Area					SMUD	SCE Planning Area					LADWP	SDGE Planning Area			BGP	OTHER	DWR	TOTAL
	Bundled Customers	Direct Access Sales	PG&E Service Area Total	Public Utility Sales	Total Planning Area	Service Area	Bundled Customers	Direct Access Sales	SCE Service Area Total	Public Utility Sales	Total Planning Area		Bundled Customers	Direct Access Sales	Total Planning Area				
1990	69,445	0	69,445	13,369	82,814	8,358	70,370	0	70,370	7,901	78,271	22,244	14,460	0	14,460	2,955	3,310	8,171	220,583
1991	69,571	0	69,571	13,214	82,785	8,349	68,996	0	68,996	7,787	76,783	21,417	14,294	0	14,294	2,762	3,323	4,400	214,113
1992	70,671	0	70,671	13,467	84,138	8,496	70,936	0	70,936	7,545	78,482	22,145	15,218	0	15,218	2,934	3,513	4,088	219,014
1993	70,654	0	70,654	13,382	84,036	8,435	69,876	0	69,876	7,654	77,529	21,498	15,134	0	15,134	2,996	3,602	4,372	217,602
1994	70,733	0	70,733	13,350	84,084	8,418	71,117	0	71,117	7,952	79,069	20,308	15,381	0	15,381	3,007	3,758	4,946	218,970
1995	71,797	0	71,797	13,467	85,264	8,458	71,548	0	71,548	7,577	79,124	20,939	15,524	0	15,524	3,089	3,819	3,562	219,779
1996	73,273	0	73,273	13,746	87,019	8,805	73,766	0	73,766	8,029	81,795	21,228	16,046	0	16,046	3,160	3,989	5,146	227,187
1997	76,241	0	76,241	14,327	90,568	9,006	76,057	0	76,057	8,300	84,356	21,605	16,698	0	16,698	3,243	3,980	5,504	234,960
1998	70,121	5,559	75,680	14,364	90,044	9,123	76,613	6,161	82,774	8,215	90,988	21,412	13,609	3,641	17,249	3,307	3,919	3,421	239,463
1999	71,251	7,958	79,209	14,564	93,773	9,326	74,350	8,819	83,169	8,588	91,756	21,434	12,719	5,211	17,931	3,249	4,017	5,490	246,976
2000	73,387	8,396	81,783	15,039	96,822	9,491	76,468	9,304	85,772	6,770	92,543	22,146	13,430	5,498	18,928	3,331	4,236	5,490	252,987
2001	75,319	2,952	78,271	14,013	92,283	9,070	68,387	10,103	78,490	8,757	87,246	21,404	14,919	2,444	17,363	3,268	4,399	6,349	241,384
2002	68,445	9,820	78,265	15,358	93,623	9,383	68,431	11,228	79,659	8,876	88,536	22,290	14,364	3,405	17,769	3,189	4,556	8,181	247,527
2003	71,084	9,127	80,211	15,427	95,638	9,924	70,677	11,571	82,248	7,797	90,045	23,044	14,930	3,467	18,398	3,283	4,494	8,865	253,690
2006	74,891	9,421	84,311	16,143	100,454	10,562	75,116	11,846	86,961	8,521	95,482	23,860	16,123	3,611	19,734	3,287	4,710	8,865	266,954
2007	76,030	9,478	85,508	16,366	101,874	10,785	76,196	11,905	88,101	8,644	96,744	23,945	16,397	3,637	20,033	3,271	4,776	8,865	270,295
2008	77,075	9,568	86,643	16,536	103,180	11,035	77,342	11,967	89,309	8,779	98,088	24,055	16,732	3,673	20,405	3,257	4,833	8,865	273,718
2009	78,191	9,643	87,834	16,738	104,571	11,291	78,565	12,039	90,604	8,923	99,527	24,161	17,026	3,702	20,728	3,250	4,892	8,865	277,286
2010	79,397	9,716	89,113	16,961	106,074	11,545	79,669	12,097	91,767	9,054	100,821	24,263	17,312	3,731	21,042	3,235	4,955	8,865	280,802
2011	80,766	9,783	90,549	17,195	107,744	11,828	80,727	12,154	92,881	9,175	102,056	24,341	17,595	3,758	21,353	3,219	5,021	8,865	284,427
2012	81,920	9,855	91,774	17,370	109,145	12,122	81,896	12,222	94,118	9,310	103,428	24,428	17,882	3,786	21,668	3,204	5,078	8,865	287,938
2013	83,248	9,927	93,175	17,595	110,769	12,420	82,958	12,281	95,238	9,431	104,670	24,511	18,167	3,813	21,981	3,189	5,143	8,865	291,548
2014	84,318	9,997	94,315	17,752	112,067	12,723	84,130	12,351	96,481	9,563	106,044	24,598	18,450	3,840	22,290	3,175	5,199	8,865	294,961
2015	85,422	10,053	95,475	17,907	113,382	13,001	85,281	12,413	97,694	9,688	107,382	24,669	18,732	3,864	22,596	3,161	5,262	8,865	298,317
2016	86,467	10,104	96,571	18,043	114,614	13,275	86,254	12,456	98,710	9,791	108,500	24,728	19,007	3,887	22,893	3,146	5,326	8,865	301,348

**Annual Growth Rates (%)**

1990-2000	0.6		1.2		1.6	1.3	0.8		2.0	-1.5	1.7	0.0	-0.7		2.7	1.2	2.5	-3.9	1.4
2000-2003	-1.1	2.8	-0.6	0.9	-0.4	1.5	-2.6	7.5	-1.4	4.8	-0.9	1.3	3.6	-14.2	-0.9	-0.5	2.0	17.3	0.1
2003-2008	1.6	0.9	1.6	1.4	1.5	2.1	1.8	0.7	1.7	2.4	1.7	0.9	2.3	1.2	2.1	-0.2	1.5	0.0	1.5
2008-2016	1.4	0.7	1.4	1.1	1.3	2.3	1.4	0.5	1.3	1.4	1.3	0.3	1.6	0.7	1.4	-0.4	1.2	0.0	1.2
2003-2016	1.5	0.8	1.4	1.2	1.4	2.3	1.5	0.6	1.4	1.8	1.4	0.5	1.9	0.9	1.7	-0.3	1.3	0.0	1.3

Retail Sales = Total Electricity Consumption - Self generation; it does not include transmission or distribution losses.



**Form 1.2 - Statewide  
California Energy Demand 2006-2016 Staff Forecast  
Net Energy for Load (GWh)**

Year	Total Consumption	Net Losses	Gross Generation	Private Supply	Net Energy for Load
1980	167,935	14,475	182,410	920	181,490
1981	175,957	15,078	191,034	934	190,100
1982	171,688	14,700	186,387	1,231	185,156
1983	173,896	14,924	188,820	2,142	186,678
1984	186,666	15,957	202,623	2,459	200,164
1985	193,673	16,408	210,081	2,877	207,203
1986	194,038	16,344	210,383	3,844	206,539
1987	203,865	17,062	220,927	5,466	215,460
1988	213,894	17,664	231,558	7,665	223,892
1989	220,720	18,088	238,808	8,456	230,352
1990	229,367	18,759	248,126	8,784	239,342
1991	223,032	18,377	241,409	8,919	232,490
1992	227,854	18,819	246,673	8,840	237,833
1993	227,423	18,673	246,096	9,821	236,275
1994	229,440	18,681	248,120	10,469	237,651
1995	230,315	18,856	249,172	10,536	238,636
1996	238,100	19,391	257,491	10,912	246,579
1997	246,132	20,034	266,166	11,172	254,993
1998	250,165	20,372	270,537	10,702	259,835
1999	257,505	20,934	278,440	10,529	267,910
2000	262,985	21,491	284,476	9,998	274,478
2001	250,693	20,535	271,228	9,307	261,921
2002	258,144	21,012	279,156	10,616	268,540
2003	264,824	21,516	286,340	11,133	275,208
2006	278,784	22,622	301,406	11,830	289,576
2007	282,324	22,899	305,223	12,029	293,193
2008	285,867	23,179	309,046	12,148	296,897
2009	289,568	23,471	313,039	12,282	300,757
2010	293,214	23,763	316,977	12,413	304,564
2011	296,976	24,065	321,041	12,549	308,492
2012	300,612	24,352	324,964	12,674	312,290
2013	304,355	24,652	329,007	12,806	316,201
2014	307,885	24,930	332,814	12,924	319,890
2015	311,352	25,203	336,555	13,035	323,520
2016	314,471	25,451	339,922	13,123	326,800

**Annual Growth Rates (%)**

1980-1990	3.2	2.6	3.1	25.3	2.8
1990-2000	1.4	1.4	1.4	1.3	1.4
2000-2003	0.2	0.0	0.2	3.6	0.1
2003-2008	1.5	1.5	1.5	1.8	1.5
2008-2016	1.2	1.2	1.2	1.0	1.2
2003-2016	1.3	1.3	1.3	1.3	1.3

**Form 1.4 - Statewide  
California Energy Demand 2006-2016 Staff Forecast  
Noncoincident Peak Demand (MW)**

	Total End Use Load	Net Losses	Gross Generation	Private Supply	Net Peak Demand	Load Factor (%)
1980	32,860	2,914	35,773	154	35,619	58.2
1981	34,378	3,040	37,419	157	37,262	58.2
1982	31,965	2,823	34,788	207	34,581	61.1
1983	33,997	2,994	36,990	360	36,631	58.2
1984	37,516	3,302	40,818	413	40,405	56.6
1985	37,482	3,296	40,778	483	40,295	58.7
1986	36,760	3,204	39,964	645	39,319	60.0
1987	37,465	3,250	40,715	918	39,797	61.8
1988	41,414	3,571	44,985	1,287	43,699	58.5
1989	40,305	3,455	43,760	1,420	42,340	62.1
1990	44,550	3,822	48,372	1,475	46,907	58.2
1991	42,980	3,680	46,661	1,497	45,164	58.8
1992	44,902	3,839	48,742	1,484	47,258	57.5
1993	42,982	3,671	46,653	1,649	45,004	59.9
1994	45,122	3,840	48,962	1,758	47,204	57.5
1995	45,662	3,894	49,555	1,769	47,787	57.0
1996	47,823	4,078	51,901	1,832	50,069	56.2
1997	49,787	4,257	54,044	1,876	52,168	55.8
1998	51,952	4,457	56,409	1,797	54,612	54.3
1999	50,642	4,346	54,988	1,768	53,220	57.5
2000	51,052	4,385	55,437	1,678	53,758	58.3
2001	47,281	4,063	51,343	1,562	49,781	60.1
2002	50,922	4,355	55,277	1,782	53,495	57.3
2003	52,681	4,491	57,172	1,869	55,303	56.8
2004	53,689	4,569	58,258	1,919	56,339	57.4
2006	56,439	4,806	61,246	1,986	59,260	55.8
2007	57,214	4,871	62,085	2,019	60,066	55.7
2008	57,981	4,937	62,917	2,039	60,878	55.7
2009	58,786	5,005	63,791	2,062	61,729	55.6
2010	59,578	5,073	64,651	2,084	62,567	89.9
2011	60,400	5,144	65,544	2,107	63,437	55.5
2012	61,196	5,212	66,408	2,128	64,280	55.5
2013	62,012	5,282	67,294	2,150	65,144	55.4
2014	62,789	5,348	68,138	2,170	65,968	55.4
2015	63,574	5,415	68,989	2,188	66,801	55.3
2016	64,295	5,478	69,772	2,203	67,569	55.2

**Annual Growth Rates (%)**

1980-1990	3.1	2.8	3.1	25.3	2.8
1990-2000	1.4	1.4	1.4	1.3	1.4
2000-2001	-7.4	-7.4	-7.4	-6.9	-7.4
2000-2003	1.1	0.8	1.0	3.6	0.9
2003-2008	1.9	1.9	1.9	1.8	1.9
2008-2016	1.3	1.3	1.3	1.0	1.3
2003-2016	1.5	1.5	1.5	1.3	1.6

**Form 1.5a**  
**1 in 2 Electric Peak Demand by Control Area**  
**California Energy Demand 2006-2016 Staff Forecast**  
**(MW)**

<b>Noncoincident Demand</b>	2003	2004	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
PG&E North	16,946	17,154	17,997	18,257	18,492	18,744	19,019	19,329	19,589	19,889	20,130	20,390	20,638
PG&E San Francisco	900	911	955	969	982	996	1,010	1,027	1,041	1,057	1,070	1,084	1,098
Dept of Water Resources - North	133	142	142	142	142	142	142	142	142	142	142	142	142
<b>Total North of Path 15</b>	<b>17,979</b>	<b>18,206</b>	<b>19,094</b>	<b>19,368</b>	<b>19,616</b>	<b>19,881</b>	<b>20,171</b>	<b>20,498</b>	<b>20,772</b>	<b>21,088</b>	<b>21,342</b>	<b>21,616</b>	<b>21,878</b>
Path 26 Pacific Gas & Electric - South	1,890	1,912	2,006	2,036	2,062	2,091	2,122	2,157	2,186	2,220	2,247	2,277	2,305
Path 26 - Dept of Water Resources	220	234	234	234	234	234	234	234	234	234	234	234	234
<b>Total Path 26</b>	<b>2,110</b>	<b>2,146</b>	<b>2,240</b>	<b>2,270</b>	<b>2,296</b>	<b>2,325</b>	<b>2,356</b>	<b>2,391</b>	<b>2,420</b>	<b>2,454</b>	<b>2,481</b>	<b>2,511</b>	<b>2,539</b>
Southern California Edison Planning Area	19,907	20,519	21,800	22,131	22,468	22,829	23,156	23,465	23,801	24,108	24,445	24,777	25,066
Pasadena Water and Power Dept	294	308	306	304	303	303	301	300	298	297	296	295	294
San Diego Gas & Electric Planning Area	3,921	4,070	4,208	4,271	4,350	4,419	4,486	4,552	4,619	4,686	4,752	4,816	4,879
Dept of Water Resources - South	487	464	464	464	464	464	464	464	464	464	464	464	464
<b>South of Path 15</b>	<b>24,610</b>	<b>25,361</b>	<b>26,778</b>	<b>27,171</b>	<b>27,586</b>	<b>28,015</b>	<b>28,408</b>	<b>28,780</b>	<b>29,182</b>	<b>29,555</b>	<b>29,957</b>	<b>30,352</b>	<b>30,703</b>
Sacramento Municipal Utilities District	2,814	2,777	2,957	3,023	3,097	3,174	3,251	3,339	3,430	3,524	3,618	3,707	3,791
WAPA/Roseville/Redding	729	732	767	781	795	809	824	841	857	874	890	906	922
<b>Total SMUD Control Area</b>	<b>3,543</b>	<b>3,509</b>	<b>3,724</b>	<b>3,804</b>	<b>3,892</b>	<b>3,983</b>	<b>4,075</b>	<b>4,180</b>	<b>4,287</b>	<b>4,397</b>	<b>4,507</b>	<b>4,613</b>	<b>4,713</b>
Los Angeles Department of Water and Power	5,378	5,386	5,663	5,679	5,701	5,724	5,744	5,760	5,778	5,795	5,813	5,828	5,841
Burbank Public Service Dept	265	277	276	274	273	273	271	270	269	268	267	266	265
Glendale Public Service Dept	275	287	286	284	283	283	281	280	279	277	276	275	274
<b>Total LADWP Control Area</b>	<b>5,918</b>	<b>5,951</b>	<b>6,224</b>	<b>6,238</b>	<b>6,257</b>	<b>6,279</b>	<b>6,297</b>	<b>6,310</b>	<b>6,325</b>	<b>6,340</b>	<b>6,356</b>	<b>6,368</b>	<b>6,379</b>
Imperial Irrigation District	824	840	866	879	891	903	915	928	940	953	964	976	989
Far North & East Sierra	320	326	333	337	340	343	346	350	353	357	360	364	368
<b>Total Other</b>	<b>1,144</b>	<b>1,166</b>	<b>1,199</b>	<b>1,216</b>	<b>1,230</b>	<b>1,246</b>	<b>1,262</b>	<b>1,279</b>	<b>1,293</b>	<b>1,310</b>	<b>1,324</b>	<b>1,340</b>	<b>1,357</b>
<b>Total ISO Noncoincident Demand</b>	<b>44,698</b>	<b>45,713</b>	<b>48,113</b>	<b>48,808</b>	<b>49,498</b>	<b>50,221</b>	<b>50,934</b>	<b>51,669</b>	<b>52,374</b>	<b>53,097</b>	<b>53,780</b>	<b>54,479</b>	<b>55,120</b>
<b>Total State</b>	<b>55,303</b>	<b>56,339</b>	<b>59,260</b>	<b>60,066</b>	<b>60,878</b>	<b>61,729</b>	<b>62,567</b>	<b>63,437</b>	<b>64,280</b>	<b>65,144</b>	<b>65,968</b>	<b>66,801</b>	<b>67,569</b>
<b>Coincident Demand</b>													
Total ISO Coincident Demand	43,628	44,618	46,961	47,639	48,313	49,019	49,714	50,432	51,120	51,825	52,492	53,175	53,800
Total Statewide Coincident Demand	53,979	54,990	57,841	58,628	59,420	60,250	61,069	61,918	62,741	63,584	64,388	65,201	65,951

**Form 1.5b**  
**1 in 5 Electric Peak Demand by Control Area**  
**California Energy Demand 2006-2016 Staff Forecast**  
**(MW)**

<b>Noncoincident Demand</b>	2003	2004	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
PG&E North	16,946	17,154	18,365	18,630	18,870	19,127	19,407	19,724	19,990	20,296	20,542	20,806	21,060
PG&E San Francisco	900	911	975	989	1,002	1,016	1,031	1,048	1,062	1,079	1,092	1,107	1,120
Dept of Water Resources - North	133	142	142	142	142	142	142	142	142	142	142	142	142
<b>Total North of Path 15</b>	<b>17,979</b>	<b>18,206</b>	<b>19,482</b>	<b>19,761</b>	<b>20,014</b>	<b>20,285</b>	<b>20,580</b>	<b>20,914</b>	<b>21,194</b>	<b>21,516</b>	<b>21,776</b>	<b>22,055</b>	<b>22,322</b>
Path 26 Pacific Gas & Electric - South	1,890	1,912	2,047	2,077	2,104	2,133	2,165	2,201	2,231	2,265	2,293	2,324	2,352
Path 26 - Dept of Water Resources	220	234	234	234	234	234	234	234	234	234	234	234	234
<b>Total Path 26</b>	<b>2,110</b>	<b>2,146</b>	<b>2,281</b>	<b>2,311</b>	<b>2,338</b>	<b>2,367</b>	<b>2,399</b>	<b>2,435</b>	<b>2,465</b>	<b>2,499</b>	<b>2,527</b>	<b>2,558</b>	<b>2,586</b>
Southern California Edison Planning Area	19,907	20,519	22,745	23,090	23,442	23,819	24,160	24,482	24,832	25,153	25,504	25,851	26,152
Pasadena Water and Power Dept	294	308	323	322	320	320	318	317	315	314	313	311	310
San Diego Gas & Electric Planning Area	3,921	4,070	4,600	4,669	4,756	4,831	4,904	4,976	5,049	5,123	5,194	5,265	5,334
Dept of Water Resources - South	487	464	464	464	464	464	464	464	464	464	464	464	464
<b>South of Path 15</b>	<b>24,610</b>	<b>25,361</b>	<b>28,133</b>	<b>28,546</b>	<b>28,983</b>	<b>29,433</b>	<b>29,846</b>	<b>30,238</b>	<b>30,661</b>	<b>31,053</b>	<b>31,476</b>	<b>31,892</b>	<b>32,261</b>
Sacramento Municipal Utilities District	2,814	2,777	3,092	3,161	3,238	3,319	3,399	3,491	3,587	3,684	3,782	3,875	3,964
WAPA/Roseville/Redding	729	732	782	797	811	826	841	858	874	891	908	925	941
<b>Total SMUD Control Area</b>	<b>3,543</b>	<b>3,509</b>	<b>3,874</b>	<b>3,958</b>	<b>4,050</b>	<b>4,144</b>	<b>4,240</b>	<b>4,349</b>	<b>4,461</b>	<b>4,576</b>	<b>4,690</b>	<b>4,800</b>	<b>4,905</b>
Los Angeles Department of Water and Power	5,378	5,386	5,984	6,001	6,024	6,048	6,070	6,086	6,105	6,124	6,143	6,158	6,172
Burbank Public Service Dept	265	277	291	290	289	288	287	285	284	283	282	281	280
Glendale Public Service Dept	275	287	302	300	299	299	297	296	294	293	292	291	290
<b>Total LADWP Control Area</b>	<b>5,918</b>	<b>5,951</b>	<b>6,577</b>	<b>6,591</b>	<b>6,612</b>	<b>6,635</b>	<b>6,654</b>	<b>6,667</b>	<b>6,683</b>	<b>6,699</b>	<b>6,717</b>	<b>6,729</b>	<b>6,741</b>
Imperial Irrigation District	824	840	904	918	929	942	955	969	981	994	1,006	1,019	1,032
Far North & East Sierra	320	326	347	351	354	358	361	365	369	373	376	380	384
<b>Total Other</b>	<b>1,144</b>	<b>1,166</b>	<b>1,251</b>	<b>1,269</b>	<b>1,284</b>	<b>1,300</b>	<b>1,316</b>	<b>1,334</b>	<b>1,349</b>	<b>1,367</b>	<b>1,382</b>	<b>1,398</b>	<b>1,416</b>
<b>Total ISO Noncoincident Demand</b>	<b>44,698</b>	<b>45,713</b>	<b>49,896</b>	<b>50,617</b>	<b>51,335</b>	<b>52,086</b>	<b>52,825</b>	<b>53,587</b>	<b>54,320</b>	<b>55,069</b>	<b>55,779</b>	<b>56,504</b>	<b>57,169</b>
<b>Total State</b>	<b>55,303</b>	<b>56,339</b>	<b>61,598</b>	<b>62,435</b>	<b>63,280</b>	<b>64,164</b>	<b>65,035</b>	<b>65,938</b>	<b>66,813</b>	<b>67,711</b>	<b>68,567</b>	<b>69,432</b>	<b>70,230</b>
<b>Coincident Demand</b>													
Total ISO Coincident Demand	43,628	44,618	48,701	49,405	50,105	50,839	51,560	52,304	53,019	53,750	54,443	55,151	55,800
Total Statewide Coincident Demand	53,979	54,990	60,123	60,940	61,764	62,628	63,478	64,359	65,213	66,089	66,925	67,769	68,548

**Form 1.5c**  
**1 in 10 Electric Peak Demand by Control Area**  
**California Energy Demand 2006-2016 Staff Forecast**  
**(MW)**

<b>Noncoincident Demand</b>	2003	2004	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
PG&E North	16,946	17,154	18,599	18,867	19,111	19,371	19,655	19,976	20,244	20,554	20,804	21,072	21,328
PG&E San Francisco	900	911	987	1,002	1,015	1,029	1,044	1,061	1,076	1,093	1,106	1,121	1,135
Dept of Water Resources - North	133	142	142	142	142	142	142	142	142	142	142	142	142
<b>Total North of Path 15</b>	<b>17,979</b>	<b>18,206</b>	<b>19,728</b>	<b>20,011</b>	<b>20,267</b>	<b>20,542</b>	<b>20,841</b>	<b>21,179</b>	<b>21,462</b>	<b>21,789</b>	<b>22,051</b>	<b>22,334</b>	<b>22,605</b>
Path 26 Pacific Gas & Electric - South	1,890	1,912	2,073	2,104	2,131	2,161	2,193	2,229	2,259	2,294	2,323	2,353	2,382
Path 26 - Dept of Water Resources	220	234	234	234	234	234	234	234	234	234	234	234	234
<b>Total Path 26</b>	<b>2,110</b>	<b>2,146</b>	<b>2,307</b>	<b>2,338</b>	<b>2,365</b>	<b>2,395</b>	<b>2,427</b>	<b>2,463</b>	<b>2,493</b>	<b>2,528</b>	<b>2,557</b>	<b>2,587</b>	<b>2,616</b>
Southern California Edison Planning Area	19,907	20,519	23,325	23,679	24,040	24,426	24,776	25,106	25,466	25,794	26,155	26,510	26,819
Pasadena Water and Power Dept	294	308	326	325	324	323	321	320	318	317	316	315	313
San Diego Gas & Electric Planning Area	3,921	4,070	4,752	4,824	4,913	4,990	5,066	5,140	5,216	5,292	5,366	5,439	5,510
Dept of Water Resources - South	487	464	464	464	464	464	464	464	464	464	464	464	464
<b>South of Path 15</b>	<b>24,610</b>	<b>25,361</b>	<b>28,868</b>	<b>29,292</b>	<b>29,741</b>	<b>30,204</b>	<b>30,627</b>	<b>31,030</b>	<b>31,464</b>	<b>31,867</b>	<b>32,301</b>	<b>32,728</b>	<b>33,107</b>
Sacramento Municipal Utilities District	2,814	2,777	3,254	3,327	3,409	3,493	3,578	3,675	3,775	3,878	3,981	4,079	4,172
WAPA/Roseville/Redding	729	732	792	807	821	836	852	869	885	903	919	936	953
<b>Total SMUD Control Area</b>	<b>3,543</b>	<b>3,509</b>	<b>4,047</b>	<b>4,134</b>	<b>4,230</b>	<b>4,329</b>	<b>4,429</b>	<b>4,544</b>	<b>4,661</b>	<b>4,781</b>	<b>4,901</b>	<b>5,016</b>	<b>5,125</b>
Los Angeles Department of Water and Power	5,378	5,386	6,044	6,061	6,084	6,109	6,131	6,147	6,166	6,185	6,205	6,220	6,234
Burbank Public Service Dept	265	277	294	293	292	291	290	288	287	286	285	283	282
Glendale Public Service Dept	275	287	305	303	302	302	300	299	297	296	295	294	293
<b>Total LADWP Control Area</b>	<b>5,918</b>	<b>5,951</b>	<b>6,643</b>	<b>6,657</b>	<b>6,678</b>	<b>6,701</b>	<b>6,720</b>	<b>6,734</b>	<b>6,751</b>	<b>6,767</b>	<b>6,784</b>	<b>6,797</b>	<b>6,809</b>
Imperial Irrigation District	824	840	927	941	953	966	979	993	1,006	1,020	1,031	1,045	1,058
Far North & East Sierra	320	326	356	360	363	367	371	375	378	382	386	389	393
<b>Total Other</b>	<b>1,144</b>	<b>1,166</b>	<b>1,283</b>	<b>1,301</b>	<b>1,317</b>	<b>1,333</b>	<b>1,350</b>	<b>1,368</b>	<b>1,384</b>	<b>1,402</b>	<b>1,417</b>	<b>1,434</b>	<b>1,452</b>
<b>Total ISO Noncoincident Demand</b>	<b>44,698</b>	<b>45,713</b>	<b>50,903</b>	<b>51,640</b>	<b>52,373</b>	<b>53,140</b>	<b>53,895</b>	<b>54,672</b>	<b>55,420</b>	<b>56,184</b>	<b>56,909</b>	<b>57,649</b>	<b>58,328</b>
<b>Total State</b>	<b>55,303</b>	<b>56,339</b>	<b>62,876</b>	<b>63,733</b>	<b>64,598</b>	<b>65,503</b>	<b>66,394</b>	<b>67,318</b>	<b>68,215</b>	<b>69,133</b>	<b>70,010</b>	<b>70,896</b>	<b>71,713</b>
<b>Coincident Demand</b>													
Total ISO Coincident Demand	43,628	44,618	49,685	50,404	51,119	51,867	52,604	53,363	54,092	54,839	55,546	56,269	56,931
Total Statewide Coincident Demand	53,979	54,990	61,370	62,206	63,051	63,935	64,804	65,706	66,581	67,478	68,334	69,198	69,996

**Form 1.5d**  
**1 in 20 Electric Peak Demand by Control Area**  
**California Energy Demand 2006-2016 Staff Forecast**  
**(MW)**

<b>Noncoincident Demand</b>	2003	2004	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
PG&E North	16,946	17,154	18,915	19,188	19,435	19,700	19,988	20,315	20,588	20,903	21,157	21,429	21,690
PG&E San Francisco	900	911	1,004	1,019	1,032	1,046	1,062	1,079	1,094	1,111	1,125	1,140	1,154
Dept of Water Resources - North	133	142	142	142	142	142	142	142	142	142	142	142	142
<b>Total North of Path 15</b>	<b>17,979</b>	<b>18,206</b>	<b>20,061</b>	<b>20,348</b>	<b>20,609</b>	<b>20,888</b>	<b>21,192</b>	<b>21,536</b>	<b>21,824</b>	<b>22,156</b>	<b>22,423</b>	<b>22,711</b>	<b>22,986</b>
Path 26 Pacific Gas & Electric - South	1,890	1,912	2,109	2,139	2,167	2,197	2,230	2,267	2,298	2,333	2,362	2,393	2,423
Path 26 - Dept of Water Resources	220	234	234	234	234	234	234	234	234	234	234	234	234
<b>Total Path 26</b>	<b>2,110</b>	<b>2,146</b>	<b>2,343</b>	<b>2,373</b>	<b>2,401</b>	<b>2,431</b>	<b>2,464</b>	<b>2,501</b>	<b>2,532</b>	<b>2,567</b>	<b>2,596</b>	<b>2,627</b>	<b>2,657</b>
Southern California Edison Planning Area	19,907	20,519	23,720	24,080	24,447	24,840	25,196	25,532	25,897	26,231	26,598	26,960	27,274
Pasadena Water and Power Dept	294	308	327	326	324	324	322	320	319	318	316	315	314
San Diego Gas & Electric Planning Area	3,921	4,070	4,808	4,880	4,971	5,049	5,125	5,200	5,277	5,354	5,429	5,503	5,575
Dept of Water Resources - South	487	464	464	464	464	464	464	464	464	464	464	464	464
<b>South of Path 15</b>	<b>24,610</b>	<b>25,361</b>	<b>29,320</b>	<b>29,750</b>	<b>30,206</b>	<b>30,677</b>	<b>31,108</b>	<b>31,517</b>	<b>31,958</b>	<b>32,367</b>	<b>32,808</b>	<b>33,242</b>	<b>33,627</b>
Sacramento Municipal Utilities District	2,814	2,777	3,361	3,436	3,520	3,608	3,695	3,795	3,899	4,005	4,112	4,213	4,309
WAPA/Roseville/Redding	729	732	806	821	835	850	866	884	900	918	935	952	969
<b>Total SMUD Control Area</b>	<b>3,543</b>	<b>3,509</b>	<b>4,167</b>	<b>4,257</b>	<b>4,356</b>	<b>4,458</b>	<b>4,561</b>	<b>4,679</b>	<b>4,799</b>	<b>4,923</b>	<b>5,047</b>	<b>5,165</b>	<b>5,278</b>
Los Angeles Department of Water and Power	5,378	5,386	6,057	6,073	6,097	6,121	6,143	6,160	6,179	6,198	6,217	6,232	6,246
Burbank Public Service Dept	265	277	295	293	292	292	290	289	287	286	285	284	283
Glendale Public Service Dept	275	287	305	304	303	302	301	299	298	297	296	294	293
<b>Total LADWP Control Area</b>	<b>5,918</b>	<b>5,951</b>	<b>6,657</b>	<b>6,671</b>	<b>6,692</b>	<b>6,715</b>	<b>6,734</b>	<b>6,748</b>	<b>6,764</b>	<b>6,781</b>	<b>6,798</b>	<b>6,811</b>	<b>6,823</b>
Imperial Irrigation District	824	840	942	957	969	982	996	1,010	1,023	1,037	1,049	1,062	1,076
Far North & East Sierra	320	326	362	366	370	373	377	381	385	389	392	396	400
<b>Total Other</b>	<b>1,144</b>	<b>1,166</b>	<b>1,305</b>	<b>1,323</b>	<b>1,339</b>	<b>1,355</b>	<b>1,373</b>	<b>1,391</b>	<b>1,407</b>	<b>1,425</b>	<b>1,441</b>	<b>1,458</b>	<b>1,476</b>
<b>Total ISO Noncoincident Demand</b>	<b>44,698</b>	<b>45,713</b>	<b>51,723</b>	<b>52,472</b>	<b>53,216</b>	<b>53,996</b>	<b>54,763</b>	<b>55,553</b>	<b>56,313</b>	<b>57,090</b>	<b>57,827</b>	<b>58,580</b>	<b>59,269</b>
<b>Total State</b>	<b>55,303</b>	<b>56,339</b>	<b>63,851</b>	<b>64,723</b>	<b>65,603</b>	<b>66,524</b>	<b>67,431</b>	<b>68,372</b>	<b>69,284</b>	<b>70,220</b>	<b>71,112</b>	<b>72,014</b>	<b>72,846</b>
<b>Coincident Demand</b>													
Total ISO Coincident Demand	43,628	44,618	50,484	51,215	51,942	52,703	53,452	54,223	54,965	55,723	56,442	57,177	57,850
Total Statewide Coincident Demand	53,979	54,990	62,322	63,173	64,032	64,931	65,817	66,734	67,625	68,538	69,409	70,290	71,102

**Form 2.1**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Statewide Economic and Demographic Assumptions**

Year	GDP Implicit Price Deflator	Total Population (000)	GSP (Billions 2003\$)	Real Person Income (Thousands of 2003\$)	Income per Capita 2003 \$	Industrial Value Added (Millions 2003\$)
1980	50.00	23,782	636	576,391	24,236	95,802
1981	54.70	24,278	658	595,310	24,521	98,829
1982	58.04	24,805	658	602,416	24,286	101,065
1983	60.32	25,336	684	624,082	24,632	104,902
1984	62.59	25,816	746	673,319	26,081	114,532
1985	64.50	26,402	789	707,012	26,778	118,586
1986	65.92	27,052	821	737,103	27,247	116,894
1987	67.72	27,717	870	766,569	27,657	131,918
1988	70.03	28,393	922	798,350	28,118	142,611
1989	72.68	29,146	961	824,762	28,298	142,462
1990	75.49	29,829	992	850,021	28,497	143,307
1991	78.13	30,458	973	838,576	27,532	139,322
1992	79.92	30,987	972	856,823	27,651	133,465
1993	81.77	31,314	962	850,995	27,176	133,590
1994	83.51	31,523	973	860,077	27,284	136,141
1995	85.22	31,711	1,009	882,690	27,835	151,810
1996	86.83	31,962	1,046	914,445	28,610	163,626
1997	88.28	32,452	1,106	954,860	29,424	180,731
1998	89.26	32,862	1,182	1,029,358	31,324	196,254
1999	90.54	33,417	1,278	1,080,912	32,346	233,871
2000	92.52	34,059	1,374	1,165,094	34,208	275,060
2001	94.74	34,740	1,381	1,173,364	33,776	252,741
2002	96.31	35,330	1,409	1,171,437	33,157	219,685
2003	98.07	35,878	1,462	1,185,758	33,050	219,185
2004	100.00	36,359	1,515	1,224,908	33,689	224,573
2005	101.51	36,841	1,570	1,255,467	34,078	232,181
2006	103.64	37,322	1,631	1,281,876	34,347	238,078
2007	105.58	37,803	1,689	1,316,248	34,819	244,564
2008	107.36	38,284	1,755	1,354,222	35,373	252,255
2009	109.26	38,766	1,816	1,390,132	35,860	259,634
2010	111.24	39,247	1,874	1,424,897	36,306	267,046
2011	113.25	39,707	1,933	1,461,259	36,801	274,191
2012	115.23	40,168	1,994	1,497,879	37,291	281,863
2013	117.23	40,628	2,053	1,533,179	37,737	289,700
2014	119.25	41,089	2,111	1,568,218	38,167	297,473
2015	121.31	41,549	2,167	1,606,097	38,655	302,426
2016	123.42	42,010	2,222	1,642,953	39,109	306,974

**Annual Growth Rates (%)**

1980-1990	4.2	2.3	4.5	4.0	1.6	4.1
1990-2000	2.1	1.3	3.3	3.2	1.8	6.7
2000-2003	2.0	1.7	2.1	0.6	-1.1	-7.3
2003-2008	1.8	1.3	3.7	2.7	1.4	2.9
2008-2016	1.8	1.2	3.0	2.4	1.3	2.5
2003-2016	1.8	1.2	3.3	2.5	1.3	2.6

## CHAPTER 2

### PG&E PLANNING AREA

The Pacific Gas and Electric (PG&E) planning area includes (1) PG&E bundled retail customers, (2) customers served by energy service providers (ESPs) using the PG&E distribution system to deliver electricity to end-users, and (3) customers of publicly owned utility and irrigation districts in PG&E's transmission system, with the notable exception of the Sacramento Municipal Utility District (SMUD).<sup>1</sup> Since SMUD is a separate and distinct control area, it is treated as its own planning area and is discussed in a later chapter.

For purposes of this chapter, the PG&E planning area forecast includes the new members of the SMUD control area, Roseville, Redding, and the Western Area Power Administration (WAPA). To support overall electricity system analysis, staff derives forecasts by control area and CAISO congestion zone from the planning area forecasts. Using historic consumption data and regional population projections, the estimated share of the PG&E forecast for WAPA, Roseville, and Redding forecasts is subtracted from the PG&E planning area and added to the SMUD control area.<sup>2</sup> Those results are presented in Chapter 1, Tables 1-3 and 1-4. The results in this chapter are for the entire PG&E planning area.

This chapter is organized as follows. First, forecasted consumption and peak loads for the PG&E planning area are discussed; both total and per capita values are presented. The CED 2006 values are compared to the CED 2003 forecast; differences between the two forecasts are explained. The forecasted load factor, jointly determined by the consumption and peak load estimates, is also discussed. Second, sector consumption and peak load forecasts are presented. The residential, commercial, industrial and "other" sector forecasts are compared to those in CED 2003; again, differences between the two are discussed. Third, sector electricity prices used as inputs to the PG&E planning area forecast are presented. Finally, the implications of the potential inaccuracy of historical data on the forecast are discussed.



## Planning Area Results

Table 2-1 presents a comparison of the CED 2003 and CED 2006 electricity consumption and peak demand forecasts for selected years.

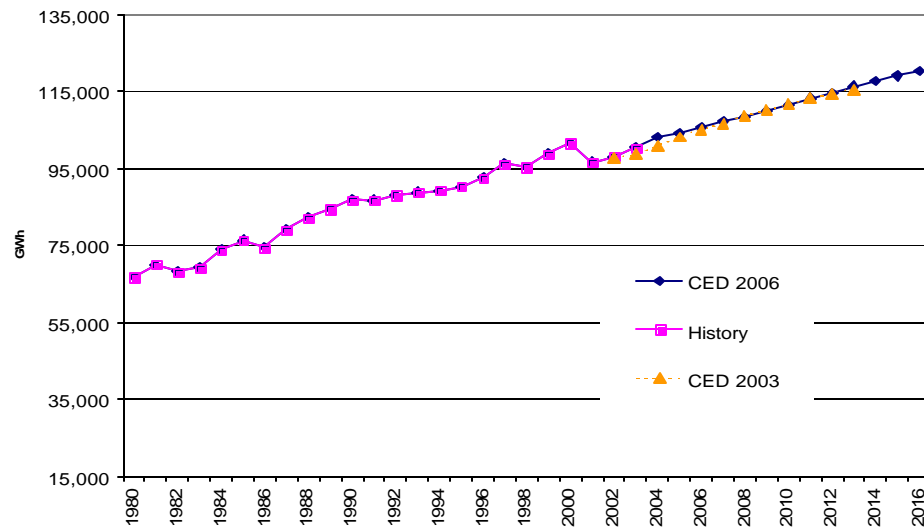
In the PG&E planning area, the major difference between forecasts is in the CED 2006 base year of 2003. The actual consumption and peak values are higher than were projected for the year 2003 in the CED 2003 forecast. This is due to a faster decline in the voluntary conservation actions taken in the energy crisis than was anticipated in the CED 2003 forecast. The major residential forecast drivers, households and household income, are very similar for both forecasts as are the commercial square footage and industrial production drivers.

**Table 2-1: PG&E Planning Area Forecast Comparison**

	Consumption (GWH)				Peak (MW)		
	CED 2003	CED 2006	%difference		CED 2003	CED 2006	%difference
1990	86,806	86,806	0.00%		17,250	17,039	-1.22%
2000	101,980	101,528	-0.44%		20,628	20,698	0.34%
2003	98,597	100,374	1.80%		20,145	20,464	1.59%
2008	108,699	108,406	-0.27%		22,206	22,331	0.56%
2013	115,507	116,325	0.71%		23,585	24,040	1.93%
2016	n/a	120,303			n/a	24,964	
Annual Average Growth Rates							
1990-2000	1.62%	1.58%			1.80%	1.96%	
2000-2003	-1.12%	-0.38%			-0.79%	-0.38%	
2003-2008	1.97%	1.55%			1.97%	1.76%	
2003-2013	1.60%	1.49%			1.59%	1.62%	
Historic values are shaded							

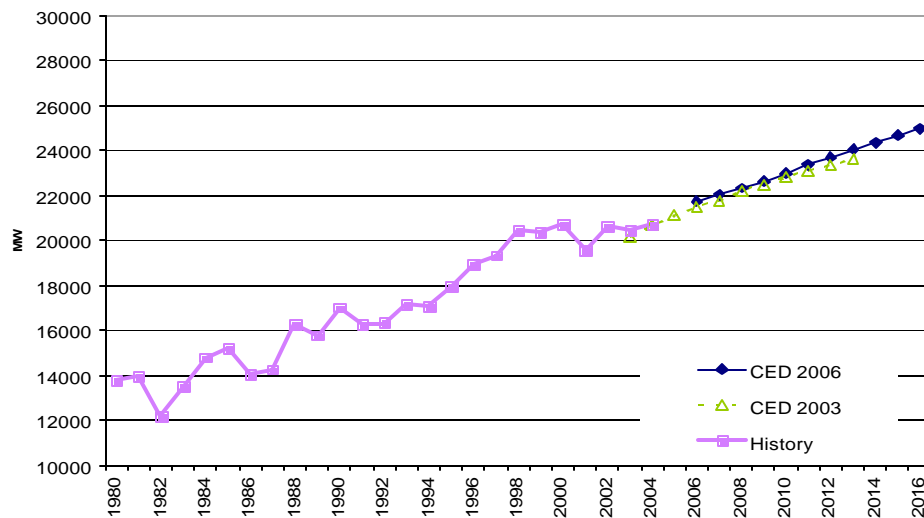
As shown in Figure 2-1, the CED 2006 electricity consumption forecast for the PG&E planning area is higher in the very near term due to actual 2003 consumption being higher than projected in the 2003-2013 forecast. This increase is, in turn, due to a larger than expected rebound from the 2001 energy crisis and a somewhat milder recession than was projected in the previous forecast. Projected growth to 2008 and 2013 is lower in the CED 2006 forecast due to lower population and personal income projections, as well as the incorporation of the impacts of the recent updates to residential and commercial building and appliance standards. The combined impact results in an electricity consumption forecast that is essentially the same as the previous forecast for the 2008 to 2013 time frame, with the two forecasts being within 1 percent of each other over this time period.

**Figure 2-1: PG&E Planning Area Electricity Forecast**



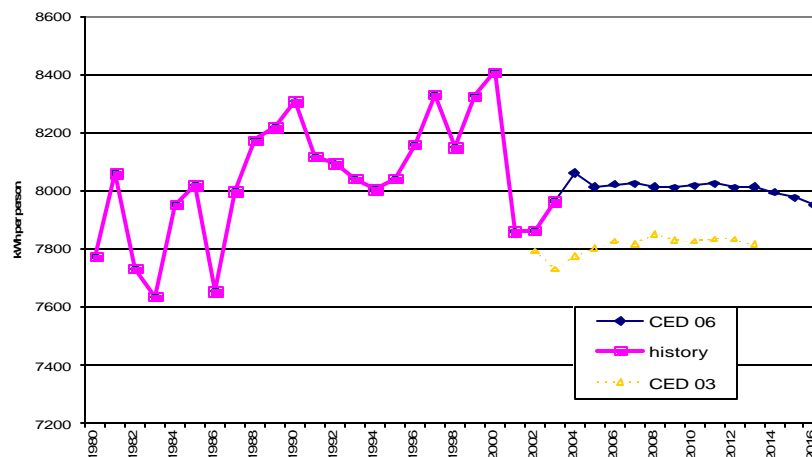
The CED 2006 PG&E planning area peak demand forecast, shown in Figure 2-2, is slightly higher over the entire forecast period compared to the CED 2003 forecast. This increase is due to the use of new residential and commercial weather-sensitive load shapes to more accurately account for air conditioning use over the summer cooling period, as well as a reduction in the assumed peak impacts of the new federal air conditioning appliance standards.

**Figure 2-2: PG&E Planning Area Peak**



Figures 2-3 provides comparisons of PG&E planning area per capita electricity consumption between the CED 2006 and CED 2003 forecasts. Per capita consumption in the CED 2006 forecast is higher than that projected in the CED 2003 forecast. This is due to a greater than anticipated rebound from the reduced consumption levels resulting from the energy crisis. The level of per capita consumption projected in the CED 2006 forecast is relatively constant and still below recent pre-energy crisis consumption levels. After a slight adjustment up in 2005 for calibration and weather adjustment, the CED 2006 per capita peak demand, shown in Figure 2-4, remains relatively constant throughout the forecast period. This level is somewhat higher than the CED 2003 level due to a full rebound from the voluntary conservation effects of the 2000-2001 energy crisis. The CED 2006 projected level of per capita peak is still below the levels seen in the mid to late 1990s, prior to the energy crisis.

**Figure 2-3: PG&E Planning Area per Capita Electricity Consumption**



**Figure 2-4: PG&E Planning Area per Capita Peak Demand**

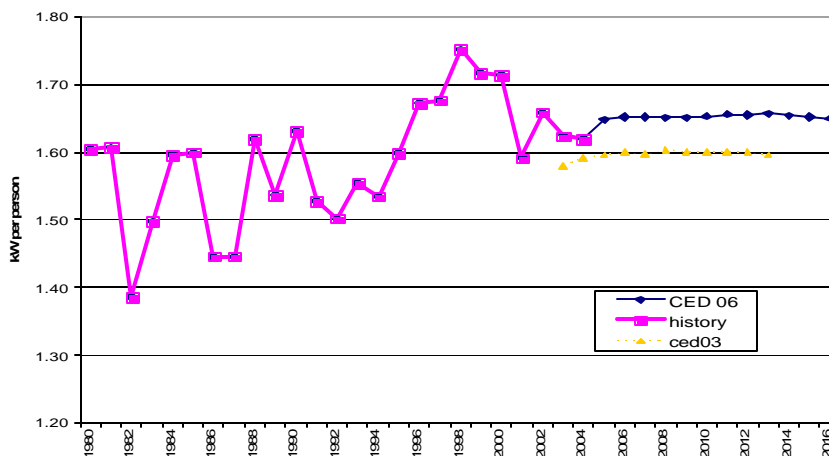
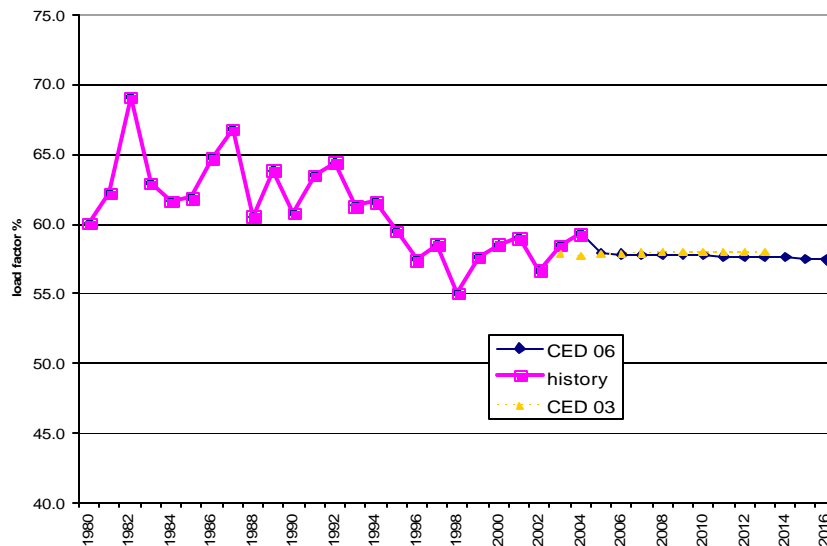


Figure 2-5 provides a comparison of the respective load factors. The load factor is a measure of the increase in peak demand relative to annual electricity consumption. Lower load factors indicate more of a needle peak; higher load factors indicate a more stable load. Actual data show a long-term downward trend as consumption shifts away from the industrial sector toward residential and commercial use. Further, more population and economic growth in the PG&E planning area is taking place in hotter inland areas, leading to greater saturation of central air conditioning and greater use of air conditioning equipment compared to earlier concentrations in the cooler Bay Area. The CED 2006 projected load factor is within the range of annual load factors of recent history and is essentially the same in the short term as the CED 2003 load factor. Over the longer forecast period, the CED 2006 load factor declines slightly which is consistent with higher weather-sensitive load growth in relation to baseload energy growth.

**Figure 2-5: PG&E Planning Area Load Factor**



## Sector Level Results and Input Assumptions

### *Residential Sector*

Figure 2-6 provides a comparison between the CED 2006 and CED 2003 PG&E planning area residential forecasts. The CED 2006 forecast is higher throughout the entire forecast period mainly because of a higher 2003 starting point. The higher starting point is caused by a greater-than-anticipated rebound from the energy crisis than was projected in the previous forecast. The forecasted growth rate from 2006-2013 is slightly lower than that previously forecast; this is due to revisions in the economic and demographic assumptions driving the residential forecast.

**Figure 2-6: PG&E Planning Area Residential Consumption**

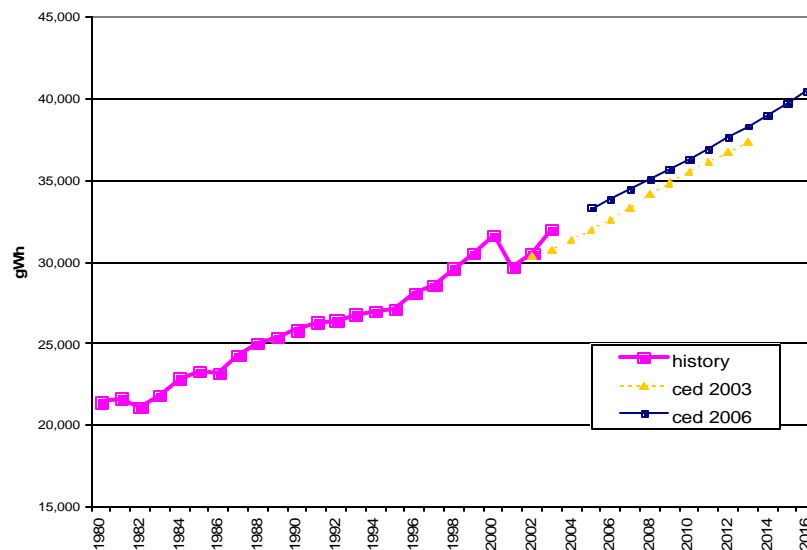
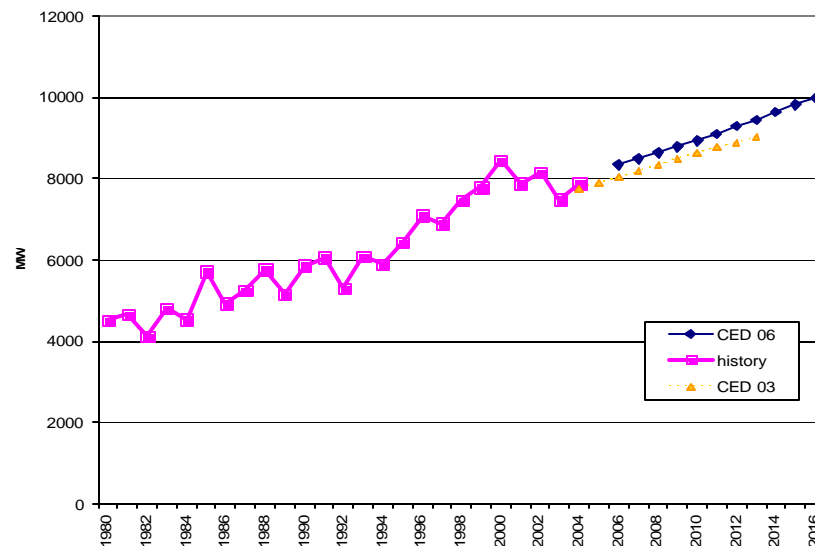


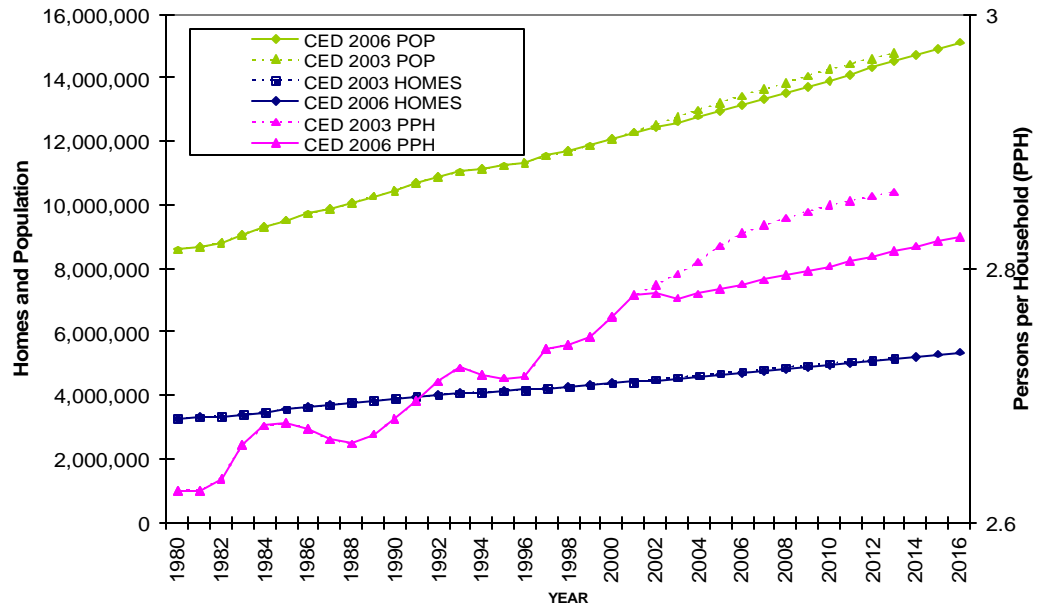
Figure 2-7 provides a comparison of the CED 2006 and CED 2003 residential peak demand forecasts. As in the electricity consumption forecast, the CED 2006 residential peak forecast is higher than that for CED 2003. The difference between the two peak forecasts is slightly greater than the difference in the electricity consumption forecasts because the savings from 2005 federal air conditioner standards are assumed to have a greater impact on annual electricity consumption than on peak.

**Figure 2-7: PG&E Planning Area Residential Peak**



Figures 2-8 and 2-9 provide comparisons of the residential drivers used in the CED 2006 forecast with those used previously. Figure 2-8 provides comparisons of the total population, total households and persons per household projections. The CED 2006 forecast of total population is lower than the previous forecast due to the lower DOF long-term population forecast. In addition, the staff has reduced the increase in persons per household to approximately half the increase observed during 1990-2000. The net result of these two changes is a projection of total households that is essentially the same for both forecasts, but with smaller average households in the CED 2006 forecast. Figure 2-9 provides a comparison of household income - per capita income times persons per household - between the two forecasts. The CED 2006 projection is lower, because not only is the persons per household estimate lower, the CED 2006 per capita income projections (prepared by Economy.com in October 2004) are lower than those assumed in the CED 2003 forecast.

**Figure 2-8: PG&E Planning Area Residential Demographic Projections**



**Figure 2-9: PG&E Planning Area Household Income Projections**

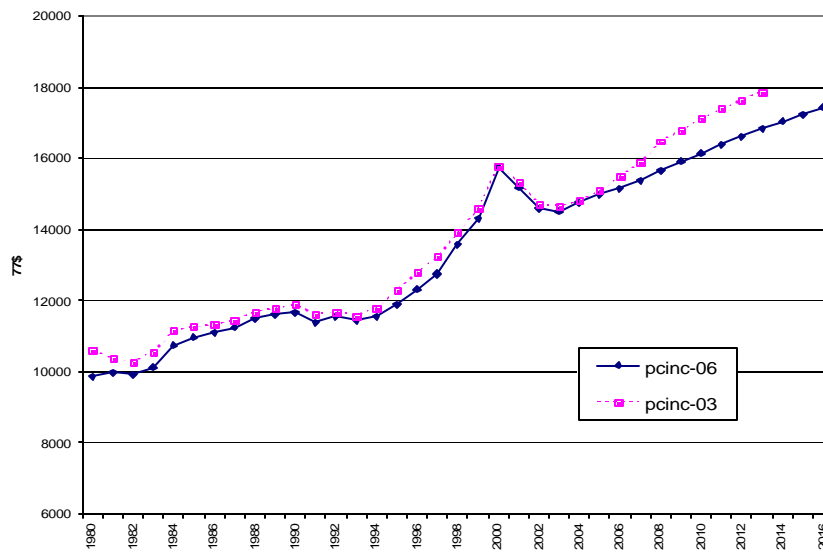
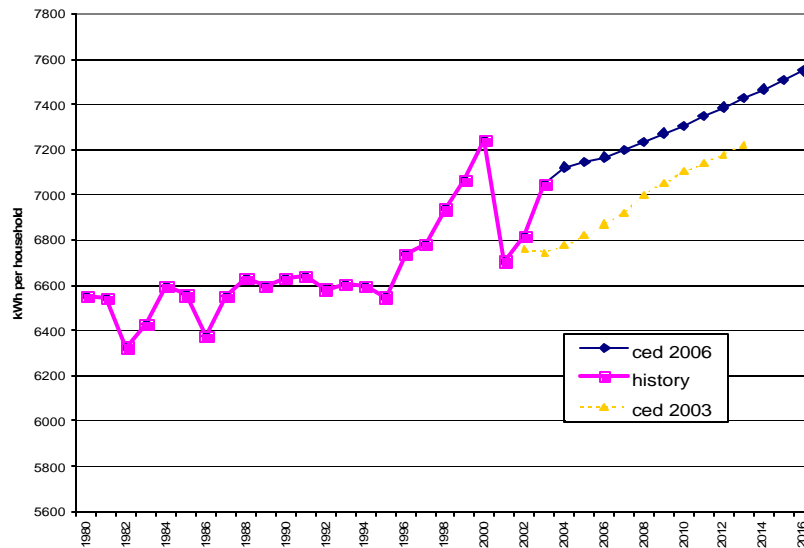


Figure 2-10 presents a comparison of electricity use per household between the two forecasts. The CED 2006 forecast is somewhat higher than that projected in CED 2003, primarily due to the higher historic starting value (2003). The CED 2006 forecasted growth rate is slightly lower than that of CED 2003 as a result of the revisions in the residential economic and demographic drivers discussed above. Essentially, residential consumption has rebounded sharply but future growth is slowed as a result of smaller households and lower household incomes than forecasted previously.

**Figure 2-10: PG&E Planning Area Use per Household**



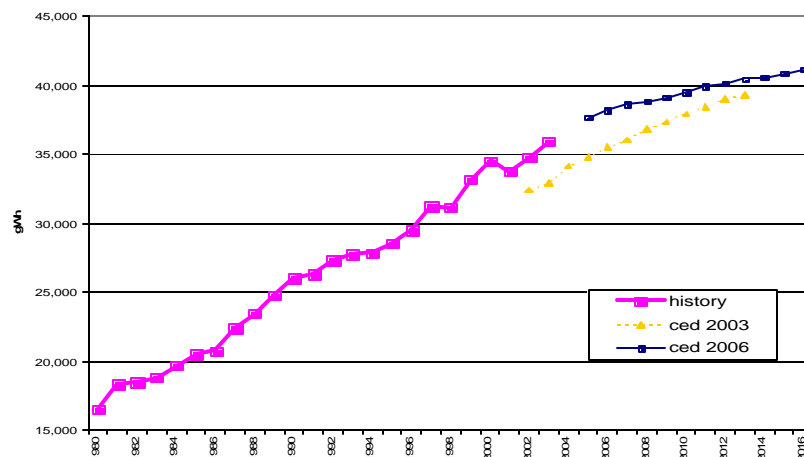


## Commercial Building Sector

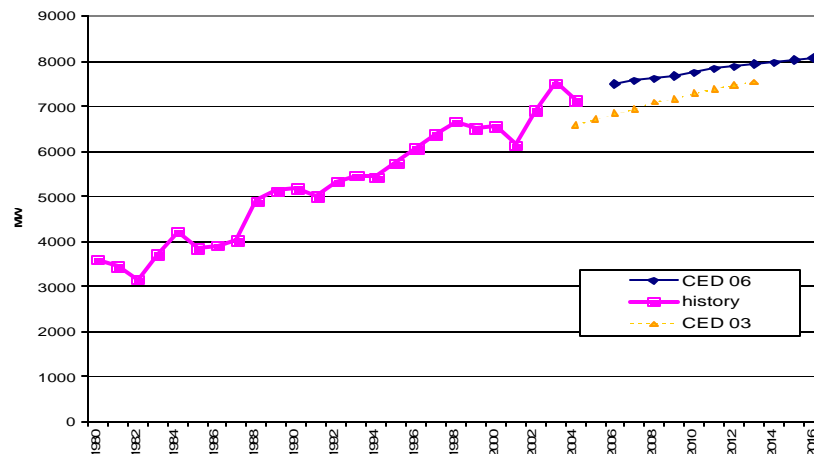
Figure 2-11 provides a comparison of the commercial building sector forecasts. The CED 2006 forecast is higher throughout the entire forecast period. This is primarily due to greater than-projected consumption in 2003 (for a discussion of this discrepancy, see the section on uncertainty below). The CED 2006 commercial building electricity consumption growth rate is lower than that projected in CED 2003, due primarily to the impacts of the 1998, 2001 and 2005 commercial building standards. In the CED 2003 forecast, staff had not yet accounted for the effects of those standards in the commercial sector model.

Figure 2-12 provides a comparison of the commercial peak demand forecasts. Growth in the respective commercial peak demand forecasts are driven primarily by the underlying electricity consumption forecast and exhibit the same pattern.

**Figure 2-11. PG&E Planning Area Commercial Consumption**

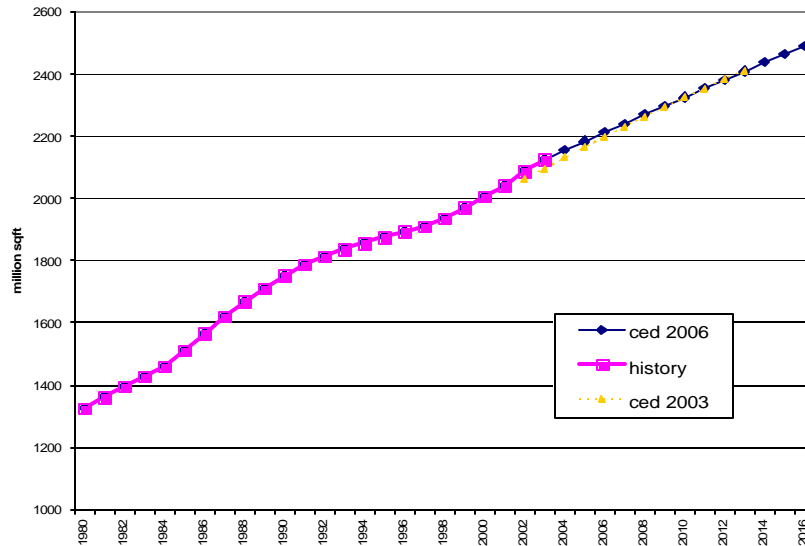


**Figure 2-12. PG&E Planning Area Commercial Sector Peak**



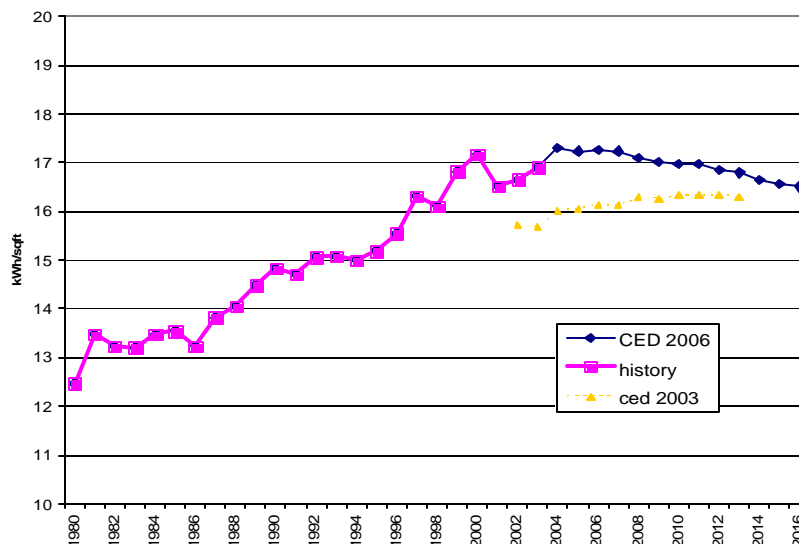
In staff's commercial building sector forecasting model, floorspace by building type is the key driver for the various building types, e.g. retail, offices, schools, etc. Figure 2-13 provides a comparison of total commercial floorspace projections. There is a slight increase in the CED 2006 floorspace projections in the near term, after which the two forecasts are nearly identical.

**Figure 2-13. PG&E Planning Area Commercial Floorspace**



The projected impacts of building standards produce a decline in use per square foot over the forecast period, as shown in Figure 2-14.

**Figure 2-14. PG&E Planning Area Commercial kWh/sq.ft.**



## Industrial Sector

Figure 2-15 provides comparisons of the PG&E planning area industrial sector electricity consumption forecasts. The CED 2006 industrial consumption forecast is lower throughout the entire forecast period, primarily due to its lower starting point in 2003. The CED 2006 forecasted growth rate is higher than that of the CED 2003 forecast. This is in marked contrast to the relationships between the two forecasts of commercial sector electricity use and may be due to the recent increase in unclassified energy consumption reported by LSEs pursuant to QFER regulations and the method of allocation of that consumption to the various non-residential sectors.

**Figure 2-15. PG&E Planning Area Industrial Consumption**

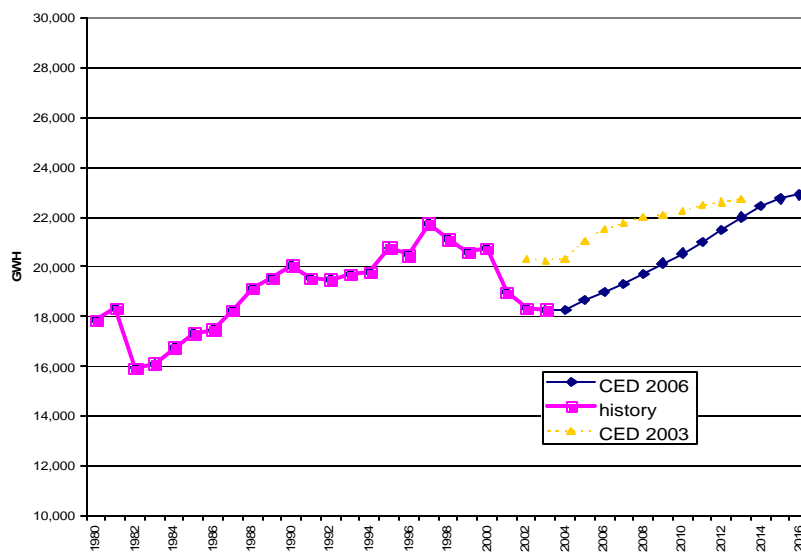


Figure 2-16 provides a comparison of the industrial sector peak forecasts. As in the consumption forecasts, the CED 2006 peak forecast starts from a lower initial 2003 value and is lower throughout the forecast period. The CED 2006 industrial peak forecast growth rate is also higher than the CED 2003 forecast growth rate, although the difference in peak growth rates is somewhat less than the difference in electricity consumption growth rates. This is partly due to reclassification of some industries in the conversion process to NAICS-based industrial classification to industry classifications with lower peak growth. Also contributing to this difference is that industrial growth is now projected at a regional level instead of statewide.

**Figure 2-16. PG&E Planning Area Industrial Sector Peak**

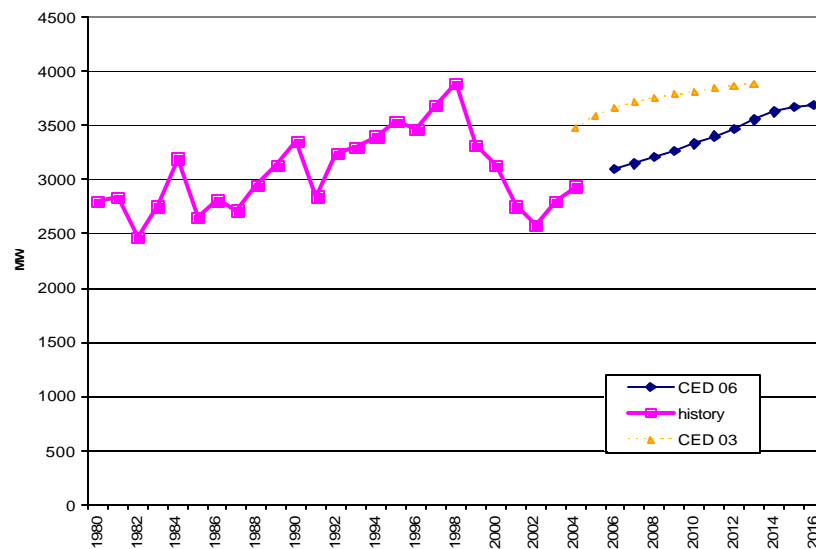
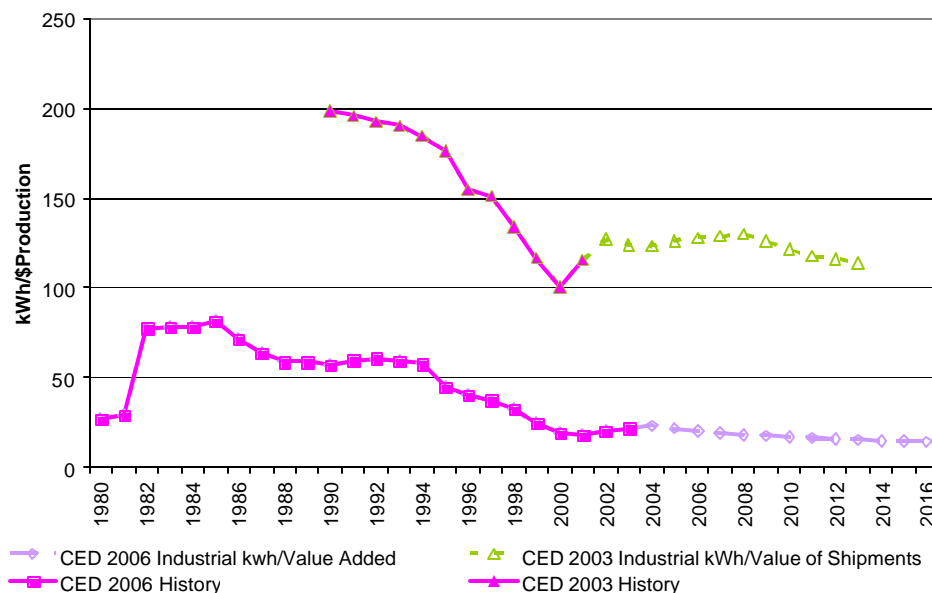


Figure 2-17 provides a comparison of electricity use per dollar of industrial production value between the CED 2006 and CED 2003 forecasts. The CED 2003 forecast used value of shipments provided by the UCLA Anderson School of Business, while the CED 2006 forecast uses value-added projections provided by Economy.com. Unlike the former, which are available only at the statewide level, the latter were provided at county and MSA levels of disaggregation. It is apparent from the historic county level economic drivers that there are major differences in economic activity in the various regions of California; use of the data provided by Economy.com for the CED 2006 forecast allowed staff to assume different patterns of economic activity in the separate utility planning areas. During the hiatus in formal planning prior to enactment of SB 1389 and thus for the CED 2003, forecast, staff prepared economic projections that grew at the same rate for all parts of the state. With the resumption of planning area-based energy assessments in this 2005 *Energy Report* cycle, the staff returned to preparing of economic/demographic projections tailored to the various sub-regions of the state.

KWh per dollar of industrial value added in the CED 2006 forecast is projected to decline slowly over the forecast period. This is in contrast to the more constant short-term (through 2008) growth in the CED 2003 forecast and in contrast to the rapid decline during 1994-2000.

**Figure 2-17. PG&E Planning Area Industrial Use Per Production Unit**



## Other Sectors

Figure 2-18 provides a comparison of the electricity consumption forecasts for the remaining sectors, including agriculture and water pumping; transportation; communication and utilities (TCU); and mining and oil extraction. The CED 2006 agriculture and water pumping forecast is higher than CED 2003 forecast due to the assumption that pumping will increase and a projected decrease in agricultural electricity rates. The CED 2006 TCU sector forecast is lower due to the decrease in the population forecast. The CED 2006 mining and oil extraction forecast is lower due to a decrease in the historic starting point.

**Figure 2-18. PG&E Planning Area Other Sector Electricity Forecasts (Agriculture & Water Pumping, TCU, Mining & oil extraction)**

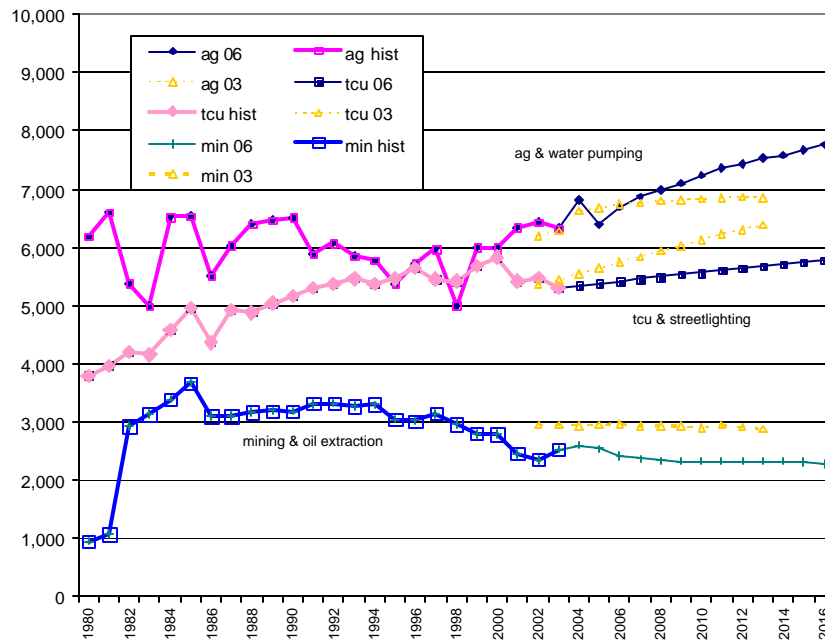
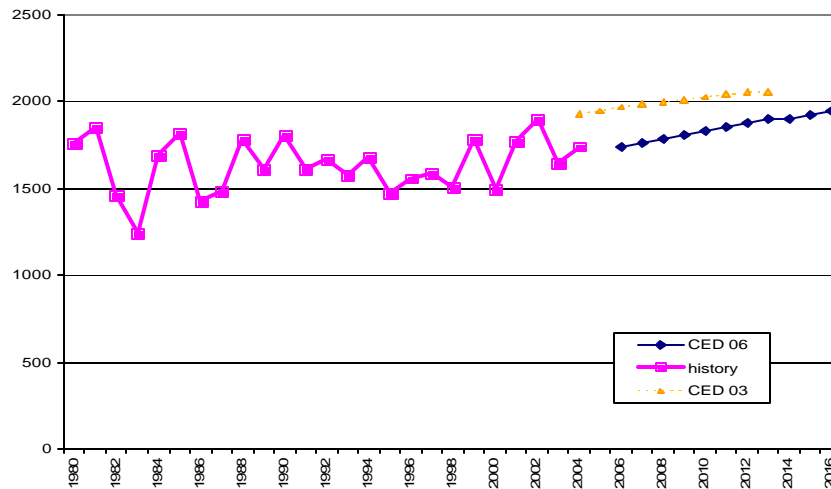


Figure 2-19 provides a comparison of the combined peak for these sectors between the two forecasts. The CED 2006 forecast is lower over the entire forecast period than the CED 2003 due to a lower assumed starting point. However, the growth rate of the CED 2006 forecast is higher than that of the CED 2003 forecast.

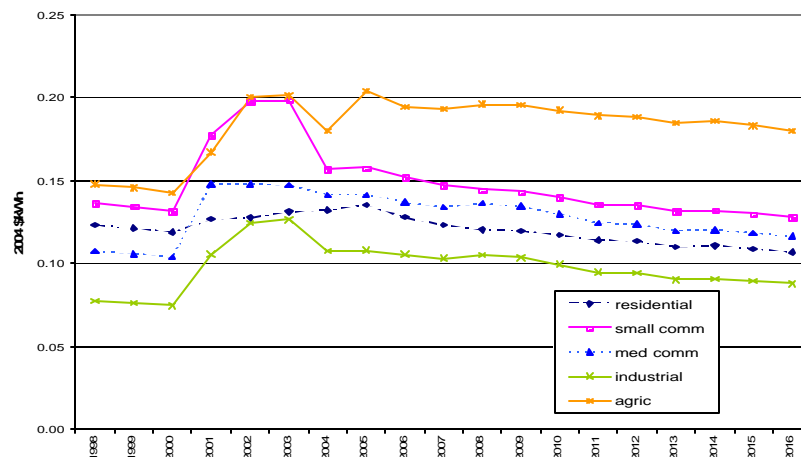
**Figure 2-19. PG&E Planning Area Other Sector Peak**



## ***Electricity Prices***

Figure 2-20 shows the sector prices used in the CED 2006 forecast for the PG&E planning area. These electricity prices are based on information provided by all LSEs in the PG&E planning area.<sup>3</sup> The planning area prices represent a weighted average of PG&E service area, municipal utility and ESP price projections by customer class.

**Figure 2-20. PG&E Planning Area Prices**



## Uncertainty Introduced by Historic Data Inaccuracy

Pursuant to QFER reporting requirements, load-serving entities are required to provide the Energy Commission with data on historical consumption classified by NAICS codes. As Figure 2-21 indicates, an increasing share of consumption is being reported as “unclassified.” In the absence of additional information, this consumption is allocated to the industrial, commercial and TCU sectors in proportion to classified sales. If the actual sectoral distribution of unclassified electricity use is different than the distribution of properly classified electricity, it will impact the forecast. For example, since commercial and industrial customers have markedly different load shapes, assigning this use to the wrong customer class could result in a too high or too low forecast of system peak.

**Figure 2-21. PG&E Planning Area Unclassified Sales**

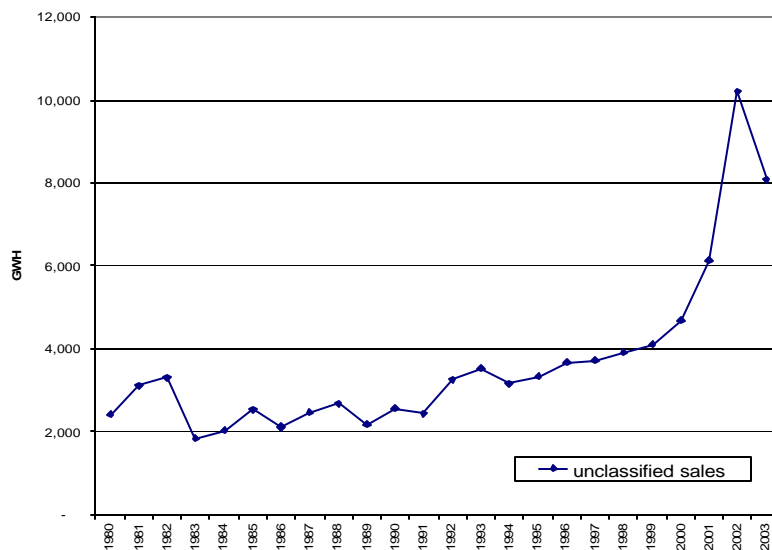
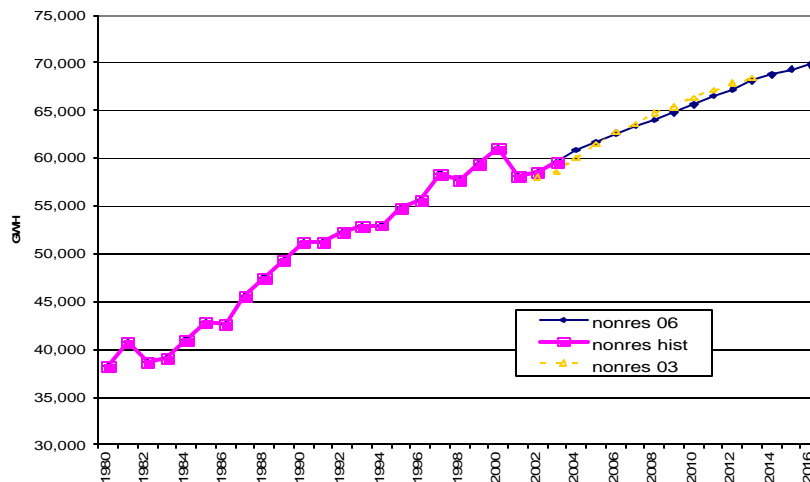




Figure 2-22 provides a comparison of the CED 2006 and CED 2003 forecasts at a more aggregate level: nonresidential consumption. This illustrates that the starting point problems arising from differences between sector consumption and peak values observed in 2003 and those forecast in CED 2003 largely “net themselves out” when the sectors are considered in aggregate. Nevertheless, the staff is trying to work with the utilities and ESPs to try to resolve reporting problems in an effort to improve both the sector and overall forecasts.

**Figure 2-22. PG&E Planning Area Nonresidential Electricity  
(Commercial, Industrial and TCU sectors)**



<sup>1</sup> The public utilities in the PG&E planning area are: Calaveras Public Power Agency (PPA); Central Valley Project; Cities of Alameda, Biggs, Gridley, Healdsburg, Lodi, Lompoc, Palo Alto, Redding, Roseville, San Francisco, and Ukiah; Lassen Municipal Utility District; Merced Irrigation District; Modesto Irrigation District; Plumas-Sierra Rural Electric Cooperation; Shasta Dam Area Public Utility District; Silicon Valley Power; Tuolumne County PPA; Turlock Irrigation District.

<sup>2</sup> In future IEPR cycles, staff will prepare PG&E planning area and SMUD control area forecasts that include small municipal utilities in the proper grouping.

<sup>3</sup> All LSEs >200MW peak demand were required to provide electricity price projections by customer sector pursuant to GENERAL INSTRUCTIONS: RETAIL ELECTRICITY PRICE FORECAST ELECTRICITY DATA REQUEST 2003-2016 adopted by Commissioner order, November 3, 2004.

**Form 1.1 - PG&E Planning Area**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Electricity Consumption by Sector (GWh)**

Year	Residential	Commercial	Industrial	Mining	Agricultural	TCU	Streetlighting	Total Consumption
1980	21,424	16,527	17,852	955	6,188	3,281	515	66,741
1981	21,632	18,366	18,332	1,069	6,598	3,486	484	69,966
1982	21,116	18,465	15,924	2,933	5,385	3,744	465	68,031
1983	21,858	18,851	16,111	3,130	4,995	3,727	431	69,103
1984	22,883	19,682	16,772	3,393	6,524	4,161	416	73,832
1985	23,292	20,483	17,333	3,676	6,544	4,530	424	76,282
1986	23,180	20,743	17,490	3,106	5,509	3,943	422	74,394
1987	24,278	22,413	18,249	3,102	6,040	4,509	417	79,009
1988	25,041	23,493	19,158	3,174	6,393	4,446	431	82,137
1989	25,389	24,814	19,522	3,197	6,476	4,601	435	84,434
1990	25,844	26,022	20,074	3,188	6,512	4,685	481	86,806
1991	26,308	26,325	19,548	3,318	5,887	4,799	508	86,693
1992	26,412	27,333	19,503	3,319	6,078	4,871	499	88,016
1993	26,781	27,714	19,709	3,268	5,850	4,955	507	88,783
1994	27,013	27,850	19,787	3,301	5,772	4,854	509	89,088
1995	27,080	28,516	20,773	3,045	5,380	4,934	527	90,256
1996	28,120	29,466	20,486	3,023	5,723	5,104	542	92,464
1997	28,599	31,203	21,750	3,144	5,975	4,897	559	96,127
1998	29,596	31,156	21,120	2,958	5,000	4,841	572	95,243
1999	30,521	33,176	20,576	2,800	6,005	5,165	509	98,752
2000	31,646	34,504	20,752	2,790	6,004	5,279	552	101,528
2001	29,657	33,735	18,975	2,461	6,351	4,908	509	96,596
2002	30,537	34,797	18,336	2,353	6,440	4,966	503	97,932
2003	31,976	35,950	18,284	2,535	6,325	4,788	516	100,374
2006	33,828	38,205	18,981	2,413	6,692	4,892	529	105,540
2007	34,415	38,631	19,310	2,366	6,867	4,925	533	107,047
2008	35,034	38,835	19,724	2,339	6,979	4,957	538	108,406
2009	35,644	39,109	20,142	2,330	7,104	4,988	542	109,857
2010	36,256	39,494	20,551	2,327	7,237	5,017	546	111,428
2011	36,937	39,951	20,995	2,326	7,362	5,053	551	113,174
2012	37,628	40,140	21,457	2,323	7,438	5,088	555	114,630
2013	38,323	40,465	21,990	2,323	7,543	5,121	560	116,325
2014	39,017	40,553	22,472	2,328	7,581	5,154	564	117,669
2015	39,723	40,831	22,739	2,312	7,672	5,185	569	119,031
2016	40,428	41,139	22,899	2,287	7,761	5,215	574	120,303

**Annual Growth Rates (%)**

1980-1990	1.9	4.6	1.2	12.8	0.5	3.6	-0.7	2.7
1990-2000	2.0	2.9	0.3	-1.3	-0.8	1.2	1.4	1.6
2000-2003	0.3	1.4	-4.1	-3.1	1.8	-3.2	-2.2	-0.4
2003-2008	1.8	1.6	1.5	-1.6	2.0	0.7	0.8	1.6
2008-2016	1.8	0.7	1.9	-0.3	1.3	0.6	0.8	1.3
2003-2016	1.8	1.0	1.7	-0.8	1.6	0.7	0.8	1.4

**Form 1.1b - PG&E Planning Area**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Electricity Sales by Sector (GWh)**

Year	Residential	Commercial	Industrial	Mining	Agricultural	TCU	Streetlighting	Total Consumption
1980	21,424	16,527	17,221	955	6,188	3,281	515	66,110
1981	21,632	18,366	17,694	1,069	6,598	3,486	484	69,329
1982	21,116	18,456	15,226	2,911	5,385	3,744	465	67,303
1983	21,858	18,833	15,267	3,048	4,994	3,724	431	68,155
1984	22,883	19,663	16,025	3,301	6,524	4,147	416	72,958
1985	23,291	20,421	16,532	3,567	6,540	4,483	424	75,258
1986	23,178	20,657	16,397	2,707	5,502	3,845	422	72,708
1987	24,274	22,264	16,412	2,463	6,033	4,403	417	76,267
1988	25,036	23,183	16,953	2,411	6,385	4,336	431	78,735
1989	25,383	24,477	17,233	2,108	6,468	4,487	435	80,591
1990	25,837	25,659	17,755	2,015	6,504	4,563	481	82,814
1991	26,302	25,936	17,423	2,064	5,878	4,675	508	82,785
1992	26,406	26,946	17,411	2,059	6,069	4,749	499	84,138
1993	26,774	27,308	16,786	1,993	5,847	4,821	507	84,036
1994	27,013	27,436	16,716	1,901	5,770	4,738	509	84,084
1995	27,080	28,102	17,715	1,645	5,378	4,818	527	85,264
1996	28,120	29,052	16,974	1,624	5,720	4,988	542	87,019
1997	28,599	30,795	18,179	1,672	5,972	4,792	559	90,568
1998	29,596	30,753	17,915	1,475	4,997	4,736	572	90,044
1999	30,521	32,768	17,374	1,524	6,005	5,071	509	93,773
2000	31,646	34,101	17,820	1,512	6,004	5,188	552	96,822
2001	29,657	33,485	16,198	1,377	6,351	4,708	509	92,283
2002	30,537	34,482	15,496	1,229	6,440	4,937	503	93,623
2003	31,976	35,690	15,000	1,372	6,325	4,759	516	95,638
2006	33,828	37,926	15,454	1,164	6,692	4,861	529	100,454
2007	34,415	38,346	15,723	1,096	6,867	4,894	533	101,874
2008	35,034	38,548	16,100	1,056	6,979	4,925	538	103,180
2009	35,644	38,818	16,476	1,032	7,104	4,956	542	104,571
2010	36,256	39,200	16,837	1,013	7,237	4,985	546	106,074
2011	36,937	39,653	17,229	992	7,362	5,020	551	107,744
2012	37,628	39,839	17,654	977	7,438	5,055	555	109,145
2013	38,323	40,160	18,137	959	7,543	5,088	560	110,769
2014	39,017	40,246	18,587	952	7,581	5,120	564	112,067
2015	39,723	40,520	18,822	925	7,672	5,151	569	113,382
2016	40,428	40,826	18,954	890	7,761	5,181	574	114,614

**Annual Growth Rates (%)**

1980-1990	1.9	4.5	0.3	7.8	0.5	3.4	-0.7	2.3
1990-2000	2.0	2.9	0.0	-2.8	-0.8	1.3	1.4	1.6
2000-2003	0.3	1.5	-5.6	-3.2	1.8	-2.8	-2.2	-0.4
2003-2008	1.8	1.6	1.4	-5.1	2.0	0.7	0.8	1.5
2008-2016	1.8	0.7	2.1	-2.1	1.3	0.6	0.8	1.3
2003-2016	1.8	1.0	1.8	-3.3	1.6	0.7	0.8	1.4

**Form 1.2 - PG&E Planning Area**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Net Energy for Load (GWh)**

Year	Total Consumption	Net Losses	Gross Generation	Private Supply	Net Energy for Load
1980	66,741	6,347	73,088	631	72,456
1981	69,966	6,656	76,622	638	75,984
1982	68,031	6,461	74,492	728	73,764
1983	69,103	6,543	75,645	948	74,698
1984	73,832	7,004	80,836	874	79,962
1985	76,282	7,225	83,506	1,024	82,482
1986	74,394	6,980	81,374	1,686	79,688
1987	79,009	7,322	86,331	2,742	83,589
1988	82,137	7,559	89,695	3,402	86,294
1989	84,434	7,737	92,171	3,843	88,328
1990	86,806	7,950	94,756	3,992	90,764
1991	86,693	7,947	94,640	3,908	90,732
1992	88,016	8,077	96,093	3,878	92,215
1993	88,783	8,067	96,850	4,747	92,104
1994	89,088	8,072	97,160	5,004	92,156
1995	90,256	8,185	98,441	4,991	93,450
1996	92,464	8,354	100,818	5,445	95,373
1997	96,127	8,695	104,822	5,559	99,262
1998	95,243	8,644	103,887	5,199	98,688
1999	98,752	9,002	107,755	4,980	102,775
2000	101,528	9,295	110,823	4,705	106,117
2001	96,596	8,859	105,455	4,313	101,142
2002	97,932	8,988	106,920	4,309	102,611
2003	100,374	9,181	109,555	4,736	104,819
2006	105,540	9,644	115,184	5,086	110,098
2007	107,047	9,780	116,827	5,173	111,654
2008	108,406	9,905	118,311	5,226	113,085
2009	109,857	10,039	119,896	5,286	114,610
2010	111,428	10,183	121,612	5,354	116,257
2011	113,174	10,343	123,518	5,430	118,087
2012	114,630	10,478	125,107	5,485	119,623
2013	116,325	10,634	126,959	5,556	121,403
2014	117,669	10,758	128,427	5,602	122,825
2015	119,031	10,885	129,916	5,649	124,267
2016	120,303	11,003	131,306	5,689	125,617

**Annual Growth Rates (%)**

1980-1990	2.7	2.3	2.6	20.3	2.3
1990-2000	1.6	1.6	1.6	1.7	1.6
2000-2003	-0.4	-0.4	-0.4	0.2	-0.4
2003-2008	1.6	1.5	1.5	2.0	1.5
2008-2016	1.4	1.4	1.4	1.2	1.4
2003-2016	1.5	1.5	1.5	1.6	1.5

**Form 1.3 - PG&E Planning Area**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Coincident Peak Demand by Sector (MW)**

Year	Residential		Commercial		Industrial			Total Industrial	Agr.	TCU & Street-lighting	Total
	Base Load	Weather Sensitive	Base Load	Weather Sensitive	Process	Assembly	Mining				
1990	4,033	1,830	3,843	1,329	1,632	1,352	373	3,357	1,249	561	16,203
1991	3,825	2,241	3,748	1,255	1,228	1,252	367	2,846	1,071	540	15,526
1992	4,038	1,267	4,005	1,324	1,577	1,289	380	3,246	1,088	576	15,544
1993	4,160	1,926	4,101	1,367	1,650	1,276	379	3,305	976	596	16,431
1994	4,300	1,590	4,227	1,208	1,734	1,278	390	3,401	1,085	597	16,408
1995	4,397	2,041	4,364	1,377	1,825	1,353	361	3,539	867	607	17,192
1996	4,395	2,704	4,456	1,607	1,746	1,369	353	3,468	938	620	18,189
1997	4,506	2,398	4,580	1,800	1,837	1,487	367	3,691	996	596	18,567
1998	5,054	2,410	4,989	1,675	1,889	1,622	378	3,890	867	642	19,526
1999	5,143	2,658	4,930	1,571	1,414	1,548	355	3,316	1,117	663	19,399
2000	4,813	3,654	4,827	1,735	1,279	1,506	347	3,132	851	645	19,658
2001	4,657	3,230	4,484	1,656	1,286	1,179	295	2,760	1,172	595	18,554
2002	4,059	4,093	4,842	2,079	1,172	1,125	286	2,583	1,273	629	19,557
2003	3,821	3,671	5,232	2,284	1,229	1,241	329	2,798	1,012	631	19,450
2004	3,869	4,020	4,962	2,170	1,497	1,142	300	2,938	1,149	594	19,702
2006	4,100	4,246	5,204	2,274	1,591	1,223	286	3,101	1,119	616	20,659
2007	4,175	4,313	5,263	2,299	1,618	1,247	281	3,147	1,145	620	20,962
2008	4,255	4,384	5,292	2,314	1,652	1,276	279	3,207	1,158	624	21,234
2009	4,332	4,456	5,331	2,331	1,687	1,305	278	3,270	1,177	628	21,525
2010	4,410	4,528	5,385	2,354	1,721	1,333	279	3,333	1,199	632	21,842
2011	4,496	4,615	5,450	2,381	1,761	1,361	279	3,401	1,221	637	22,201
2012	4,583	4,702	5,478	2,394	1,801	1,391	279	3,472	1,232	641	22,501
2013	4,670	4,790	5,525	2,414	1,850	1,423	280	3,553	1,251	645	22,847
2014	4,756	4,880	5,538	2,422	1,893	1,453	281	3,627	1,253	649	23,126
2015	4,844	4,972	5,578	2,440	1,928	1,461	280	3,669	1,269	653	23,425
2016	4,931	5,063	5,623	2,459	1,949	1,467	277	3,693	1,285	657	23,711

**Annual Growth Rates (%)**

1980-1990	4.1	0.2	3.7	3.8	0.4	2.1	11.8	1.8	-0.7	3.2	2.5
1990-2000	1.8	7.2	2.3	2.7	-2.4	1.1	-0.7	-0.7	-3.8	1.4	2.0
2000-2001	-3.3	-11.6	-7.1	-4.5	0.5	-21.7	-15.0	-11.9	37.7	-7.9	-5.6
2000-2003	-7.4	0.2	2.7	9.6	-1.3	-6.2	-1.8	-3.7	5.9	-0.8	-0.4
2003-2008	2.2	3.6	0.2	0.3	6.1	0.6	-3.2	2.8	2.7	-0.2	1.8
2008-2016	1.9	1.8	0.8	0.8	2.1	1.8	-0.1	1.8	1.3	0.6	1.4

**Form 1.4 - PG&E Planning Area**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Peak Demand (MW)**

Year	Total End Use Load	Net Losses	Gross Generation	Private Supply	Net Peak Demand	Load Factor (%)
1980	12,660	1,218	13,878	106	13,772	60.1
1981	12,820	1,233	14,053	107	13,946	62.2
1982	11,232	1,078	12,309	122	12,187	69.1
1983	12,510	1,198	13,708	159	13,548	62.9
1984	13,651	1,310	14,961	147	14,815	61.6
1985	14,040	1,345	15,386	172	15,214	61.9
1986	13,092	1,243	14,335	283	14,052	64.7
1987	13,480	1,263	14,743	460	14,283	66.8
1988	15,400	1,438	16,838	571	16,267	60.6
1989	15,037	1,396	16,433	645	15,788	63.9
1990	16,203	1,507	17,709	670	17,039	60.8
1991	15,526	1,442	16,969	656	16,313	63.5
1992	15,544	1,445	16,989	651	16,338	64.4
1993	16,431	1,516	17,947	797	17,150	61.3
1994	16,408	1,510	17,918	840	17,077	61.6
1995	17,192	1,586	18,778	838	17,940	59.5
1996	18,189	1,676	19,865	914	18,951	57.5
1997	18,567	1,711	20,278	933	19,345	58.6
1998	19,526	1,809	21,335	873	20,462	55.1
1999	19,399	1,801	21,200	836	20,364	57.6
2000	19,658	1,830	21,488	790	20,698	58.5
2001	18,554	1,730	20,284	724	19,560	59.0
2002	19,557	1,827	21,384	723	20,661	56.7
2003	19,450	1,810	21,259	795	20,464	58.5
2004	19,702	1,831	21,533	825	20,709	59.3
2006	20,659	1,921	22,580	854	21,726	57.8
2007	20,962	1,949	22,911	868	22,043	57.8
2008	21,234	1,975	23,208	877	22,331	57.8
2009	21,525	2,002	23,527	887	22,640	57.8
2010	21,842	2,031	23,873	899	22,975	57.8
2011	22,201	2,065	24,266	912	23,354	57.7
2012	22,501	2,093	24,594	921	23,673	57.7
2013	22,847	2,126	24,973	933	24,040	57.6
2014	23,126	2,152	25,278	940	24,338	57.6
2015	23,425	2,180	25,606	948	24,657	57.5
2016	23,711	2,207	25,919	955	24,964	57.4

**Annual Growth Rates (%)**

1980-1990	2.5	2.2	2.5	20.3	2.2
1990-2000	2.0	2.0	2.0	1.7	2.0
2000-2003	-0.4	-0.4	-0.4	0.2	-0.4
2003-2008	1.8	1.8	1.8	2.0	1.8
2008-2016	1.4	1.4	1.4	1.1	1.4
2003-2016	1.5	1.5	1.5	1.4	1.5

**Form 1.5 - PG&E Planning Area**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Noncoincident Peak Demand Temperature Scenarios**

Year	1-in-2 Temperatures	1-in-5 Temperatures	1-in-10 Temperatures	1-in-20 Temperatures	1-in-5 Multiplier	1-in-10 Multiplier	1-in-20 Multiplier
2006	21,726	22,170	22,453	22,834	1.020	1.033	1.051
2007	22,043	22,493	22,780	23,167	1.020	1.033	1.051
2008	22,331	22,788	23,078	23,470	1.020	1.033	1.051
2009	22,640	23,102	23,397	23,794	1.020	1.033	1.051
2010	22,975	23,444	23,743	24,146	1.020	1.033	1.051
2011	23,354	23,832	24,135	24,545	1.020	1.033	1.051
2012	23,673	24,157	24,465	24,880	1.020	1.033	1.051
2013	24,040	24,531	24,844	25,266	1.020	1.033	1.051
2014	24,338	24,835	25,152	25,579	1.020	1.033	1.051
2015	24,657	25,161	25,482	25,914	1.020	1.033	1.051
2016	24,964	25,474	25,799	26,236	1.020	1.033	1.051

**Form 1.7a - PG&E Planning Area  
California Energy Demand 2006-2016 Staff Forecast  
Private Supply by Sector (GWh)**

Year	Residential	Commercial	Industrial	Mining	Agricultural	TCU	Streetlighting	Total Consumption
1980	0	0	631	0	0	0	0	631
1981	0	0	638	0	0	0	0	638
1982	0	9	698	21	0	0	0	728
1983	0	19	844	82	0	3	0	948
1984	0	20	747	93	0	14	0	874
1985	1	63	801	109	4	47	0	1,024
1986	2	86	1,093	399	7	98	0	1,686
1987	4	149	1,837	639	7	106	0	2,742
1988	5	311	2,205	763	8	110	0	3,402
1989	6	337	2,289	1,089	8	114	0	3,843
1990	7	363	2,319	1,173	8	122	0	3,992
1991	7	390	2,124	1,254	9	124	0	3,908
1992	6	387	2,093	1,261	10	122	0	3,878
1993	7	406	2,923	1,274	3	134	0	4,747
1994	0	414	3,071	1,400	3	116	0	5,004
1995	0	414	3,058	1,400	3	116	0	4,991
1996	0	414	3,512	1,400	3	116	0	5,445
1997	0	408	3,570	1,473	3	105	0	5,559
1998	0	403	3,205	1,483	3	105	0	5,199
1999	0	408	3,202	1,276	0	94	0	4,980
2000	0	403	2,932	1,278	0	92	0	4,705
2001	0	251	2,778	1,084	0	200	0	4,313
2002	0	315	2,840	1,124	0	29	0	4,309
2003	0	260	3,284	1,163	0	28	0	4,736
2006	0	280	3,527	1,249	0	31	0	5,086
2007	0	284	3,588	1,270	0	31	0	5,173
2008	0	287	3,624	1,283	0	31	0	5,226
2009	0	291	3,666	1,298	0	32	0	5,286
2010	0	294	3,713	1,315	0	32	0	5,354
2011	0	298	3,766	1,333	0	33	0	5,430
2012	0	301	3,804	1,347	0	33	0	5,485
2013	0	305	3,853	1,364	0	33	0	5,556
2014	0	308	3,885	1,376	0	34	0	5,602
2015	0	310	3,917	1,387	0	34	0	5,649
2016	0	313	3,945	1,397	0	34	0	5,689

**Annual Growth Rates (%)**

1980-1990		13.9				20.3
1990-2000	1.1	2.4	0.9	-100.0	-2.8	1.7
2000-2003	-13.6	3.8	-3.1	#DIV/0!	-32.3	0.2
2003-2008	2.0	2.0	2.0	#DIV/0!	2.0	2.0
2008-2016	1.1	1.1	1.1	#DIV/0!	1.1	1.1
2003-2016	1.4	1.4	1.4	#DIV/0!	1.4	1.4



**Form 2.2 - PG&E Planning Area**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Planning Area Economic and Demographic Assumptions**

Year	Population	Households	Persons per Household	Per Capita Income (2003\$)	Industrial Value Added (Millions 2003\$)
1980	8,584,533	3,270,577	2.625	24,469	35,134
1981	8,680,391	3,306,645	2.625	24,696	36,437
1982	8,795,960	3,338,699	2.635	24,598	37,803
1983	9,047,696	3,400,157	2.661	25,088	39,999
1984	9,283,232	3,469,060	2.676	26,589	43,279
1985	9,511,287	3,551,749	2.678	27,133	44,919
1986	9,718,573	3,635,162	2.673	27,538	43,519
1987	9,876,853	3,706,216	2.665	27,870	48,657
1988	10,047,187	3,774,572	2.662	28,520	53,879
1989	10,273,789	3,848,713	2.669	28,794	54,306
1990	10,450,124	3,897,420	2.681	28,931	55,900
1991	10,678,197	3,961,902	2.695	28,211	55,707
1992	10,874,483	4,011,740	2.711	28,602	54,711
1993	11,037,374	4,055,134	2.722	28,349	54,932
1994	11,125,196	4,095,707	2.716	28,592	57,178
1995	11,221,518	4,135,477	2.713	29,455	67,795
1996	11,331,199	4,173,736	2.715	30,542	74,916
1997	11,538,192	4,216,615	2.736	31,597	84,283
1998	11,684,838	4,265,384	2.739	33,664	91,139
1999	11,859,731	4,319,650	2.746	35,466	113,460
2000	12,073,758	4,370,688	2.762	39,005	143,857
2001	12,290,332	4,422,097	2.779	37,607	137,888
2002	12,452,798	4,479,406	2.780	36,175	116,747
2003	12,599,783	4,537,991	2.777	35,975	115,614
2004	12,784,429	4,598,515	2.780	36,590	118,025
2005	12,970,174	4,659,255	2.784	37,135	122,399
2006	13,155,946	4,719,870	2.787	37,543	126,138
2007	13,341,739	4,780,355	2.791	38,150	130,227
2008	13,527,556	4,840,714	2.795	38,841	134,983
2009	13,713,382	4,900,938	2.798	39,455	139,632
2010	13,899,286	4,961,055	2.802	40,021	144,348
2011	14,104,158	5,027,136	2.806	40,607	148,963
2012	14,309,058	5,093,079	2.810	41,195	153,915
2013	14,513,969	5,158,880	2.813	41,736	158,962
2014	14,718,886	5,224,533	2.817	42,253	164,030
2015	14,923,828	5,290,054	2.821	42,766	166,620
2016	15,128,765	5,355,426	2.825	43,242	168,996

**Annual Growth Rates (%)**

1980-1990	2.0	1.8	0.2	1.7	4.8
1990-2000	1.5	1.2	0.3	3.0	9.9
2000-2003	1.4	1.3	0.2	-2.7	-7.0
2003-2008	1.4	1.3	0.1	1.5	3.1
2008-2016	1.4	1.3	0.1	1.4	2.8
2003-2016	1.4	1.3	0.1	1.4	3.0

**Form 2.3a - PG&E Planning Area**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Electricity Rate Forecast (2003 cents/kwh)**

Year	GDP Implicit Price Deflator	Residential	Small Commercial	Medium Commercial	Industrial	Agriculture
1990	75.49	14.03	0.00	0.00	8.50	11.79
1991	78.13	14.59	0.00	0.00	8.71	12.20
1992	79.92	14.99	0.00	0.00	9.02	12.50
1993	81.77	15.01	0.00	0.00	8.57	13.64
1994	83.51	14.95	0.00	0.00	8.40	12.85
1995	85.22	13.58	0.00	0.00	7.47	12.35
1996	86.83	13.94	0.00	0.00	7.97	12.33
1997	88.28	13.71	0.00	0.00	7.83	14.97
1998	89.26	12.32	13.67	10.76	7.75	14.80
1999	90.54	12.15	13.47	10.60	7.64	14.59
2000	92.52	11.89	13.19	10.38	7.46	14.28
2001	94.74	12.67	17.77	14.83	10.55	16.73
2002	96.31	12.76	19.79	14.80	12.43	20.06
2003	98.07	13.12	19.86	14.73	12.65	20.14
2004	100.00	13.23	15.70	14.16	10.77	18.02
2005	101.51	13.53	15.79	14.16	10.80	20.40
2006	103.64	12.79	15.22	13.72	10.57	19.46
2007	105.58	12.31	14.71	13.41	10.33	19.35
2008	107.36	12.04	14.46	13.64	10.55	19.62
2009	109.26	11.96	14.34	13.45	10.37	19.56
2010	111.24	11.70	13.99	13.00	9.97	19.26
2011	113.25	11.40	13.57	12.44	9.48	18.91
2012	115.23	11.36	13.52	12.37	9.43	18.86
2013	117.23	11.00	13.14	11.98	9.04	18.49
2014	119.25	11.08	13.23	12.06	9.09	18.63
2015	121.31	10.89	13.01	11.85	8.94	18.31
2016	123.42	10.70	12.79	11.65	8.78	18.00

**Annual Growth Rates (%)**

1990-2000	2.1	-1.6			-1.3	1.9
2000-2003	2.0	3.3	14.6		19.2	12.1
2003-2008	1.8	-1.7	-6.1		-3.6	-0.5
2008-2016	1.8	-1.5	-1.5		-2.3	-1.1
2003-2016	1.8	-1.6	-3.3		-2.8	-0.9

**Form 2.3b - PG&E Planning Area**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Natural Gas Price Forecast (2003 \$/MCF)**

	Core			Noncore				
	Residential	Commercial	Industrial	Commercial	Industrial	TEOR	Cogeneration	Electric Generation
1990	6.83	7.36	6.25	4.73	4.39	3.29	2.82	3.995
1991	6.97	7.39	6.42	4.01	4.01	3.04	2.81	3.157
1992	6.73	7.48	5.47	3.10	3.10	2.92	2.04	1.863
1993	6.42	6.87	5.44	3.40	3.40	2.67	1.32	1.738
1994	6.69	6.92	5.33	4.50	5.75	1.13	0.48	0.975
1995	7.03	7.21	5.17	4.34	4.38	1.69	1.90	1.970
1996	6.37	6.36	5.23	4.38	4.52	2.28	2.43	2.436
1997	6.61	6.62	5.65	4.63	4.64	3.25	2.77	2.868
1998	6.77	6.76	5.68	2.93	2.62	2.58	2.48	2.694
1999	6.80	6.66	5.87	3.01	3.05	3.29	2.95	2.928
2000	8.10	8.13	7.10	5.16	5.18	6.13	5.00	5.036
2001	5.80	6.54	5.32	7.21	7.35	6.19	6.31	6.365
2002	6.68	6.17	5.32	3.34	3.28	3.38	3.09	0.000
2003	8.92	8.54	7.97	5.44	5.20	5.47	5.00	5.104
2004	9.10	8.67	7.90	5.78	5.59	5.31	5.04	5.326
2005	8.85	8.79	6.73	6.43	5.60	5.79	5.58	5.58
2006	8.29	8.23	6.17	5.89	5.05	5.24	5.02	5.02
2007	8.43	8.37	6.27	5.99	5.13	5.32	5.11	5.11
2008	8.69	8.63	6.60	6.32	5.49	5.67	5.46	5.46
2009	8.89	8.82	6.80	6.53	5.69	5.88	5.67	5.67
2010	8.44	8.38	6.35	6.08	5.25	5.43	5.22	5.22
2011	9.09	9.03	7.05	6.79	5.97	6.15	5.95	5.95
2012	8.98	8.93	6.98	6.72	5.92	6.10	5.90	5.90
2013	9.69	9.63	7.68	7.43	6.62	6.80	6.60	6.60
2014	10.20	10.14	8.26	8.02	7.23	7.41	7.21	7.21
2015	10.24	10.19	8.32	8.09	7.31	7.49	7.29	7.29
2016	10.37	10.31	8.47	8.24	7.46	7.64	7.44	7.44

**Annual Growth Rates (%)**

1990-2000	1.7	1.0		0.9	1.7	6.4	5.9
2000-2003	3.3	1.6	4.0	1.8	0.1	-3.8	0.0
2003-2008	-0.5	0.2	-3.7	3.0	1.1	0.7	1.8
2008-2016	2.2	2.2	3.2	3.4	3.9	3.8	3.9
2003-2016	1.2	1.5	0.5	3.2	2.8	2.6	3.1

# **CHAPTER 3**

## **SCE PLANNING AREA**

The Southern California Edison (SCE) planning area includes (1) SCE bundled retail customers, (2) customers served by various energy service providers (ESPs) using the SCE distribution system to deliver electricity to end users, and (3) customers of the various southern California municipal and irrigation district utilities with the exception of the cities of Los Angeles, Pasadena, Glendale and Burbank and the Imperial Irrigation District. Also not included in the SCE planning area is San Diego County and the southern portion of Orange County served by SDG&E.

This chapter is organized as follows. First, forecasted consumption and peak loads for the SCE planning area are discussed; both total and per capita values are presented. The CED 2006 values are compared to the CED 2003 forecast; differences between the two forecasts are explained. The forecasted load factor, jointly determined by the consumption and peak load estimates, is also discussed. Second, sector consumption and peak load forecasts are presented. The residential, commercial, industrial and “other” sector forecasts are compared to those in CED 2003; again, differences between the two are discussed. Third, the sector electricity prices used as inputs to the CED 2006 forecast are presented. Finally, the implications of the potential inaccuracy of historical data for the forecast are discussed.

### **Forecast Results**

Table 3-1 compares the CED 2003 and CED 2006 forecasts of electricity consumption and peak demand for selected years. The CED 2006 electricity consumption forecast is almost 5 percent higher in 2003 than forecasted in CED 2003. This mainly due to both higher historic economic and demographic inputs in the residential and commercial sectors than were forecasted for 2003 in the CED 2003 forecast. Recent regional historic economic data for indicate that there was very little impact of the recent recession in the SCE planning area. In preparing economic projections for the CED 2003 forecast staff assumed an equal impact in all areas of the state by use of common statewide growth assumptions for all regions. In retrospect, the recent California recession essentially only impacted the PG&E planning area (Bay Area). The southern California region was relatively unaffected and continued to grow the recession. Also contributing is an apparent faster decline in the voluntary conservation actions taken in the energy crisis than was anticipated in the CED 2003 forecast.

In the forecast period however, the major residential forecast drivers, population, households and household income, are projected to grow at a slower rate than was forecast in CED 2003. Commercial floorspace is projected to grow at a slightly faster rate than CED 2003 projections, while industrial production drivers are forecast to be relatively similar. The net result of these differences is that the rate of growth in the CED 2006 electricity forecast is slightly lower than was projected in the CED 2003

forecast. Due to reduction in peak impacts of the federal air conditioning standards, explained in Chapter 1, the CED 2006 peak forecast grows slightly faster than the CED 2003 forecast.

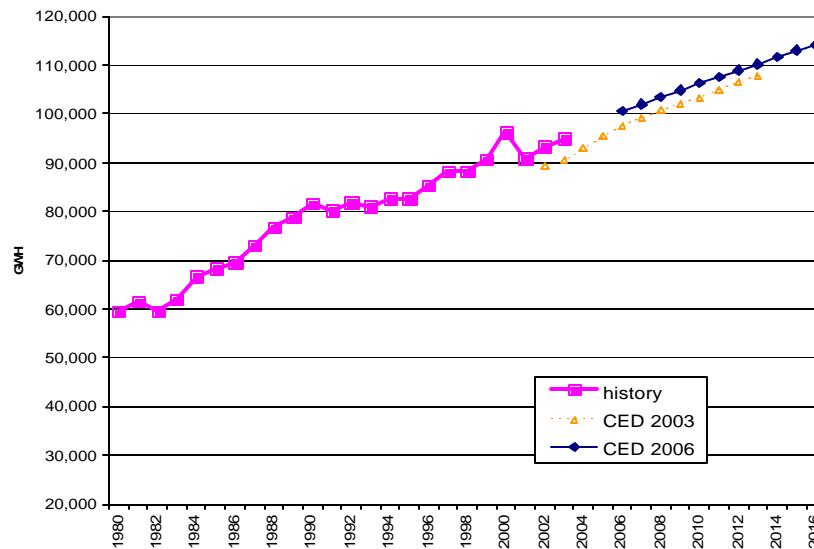
**Table 3-1: SCE Planning Area Forecast Comparison**

	Consumption (GWH)				Peak (MW)		
	CED 2003	CED 2006	%difference		CED 2003	CED 2006	%difference
1990	81,673	81,579	-0.12%		17,647	17,564	-0.47%
2000	96,496	96,319	-0.18%		19,757	19,465	-1.48%
2003	90,419	94,909	4.97%		19,118	19,907	4.13%
2008	100,745	103,354	2.59%		21,211	22,468	5.93%
2013	107,654	110,233	2.40%		22,558	24,108	6.87%
2016	n/a	114,230			n/a	25,066	
Annual Average Growth Rates							
1990-2000	1.68%	1.67%			1.14%	1.03%	
2000-2003	-2.15%	-0.49%			-1.09%	0.75%	
2003-2008	2.19%	1.72%			2.10%	2.45%	
2003-2013	1.76%	1.51%			1.67%	1.93%	
Historic values are shaded							

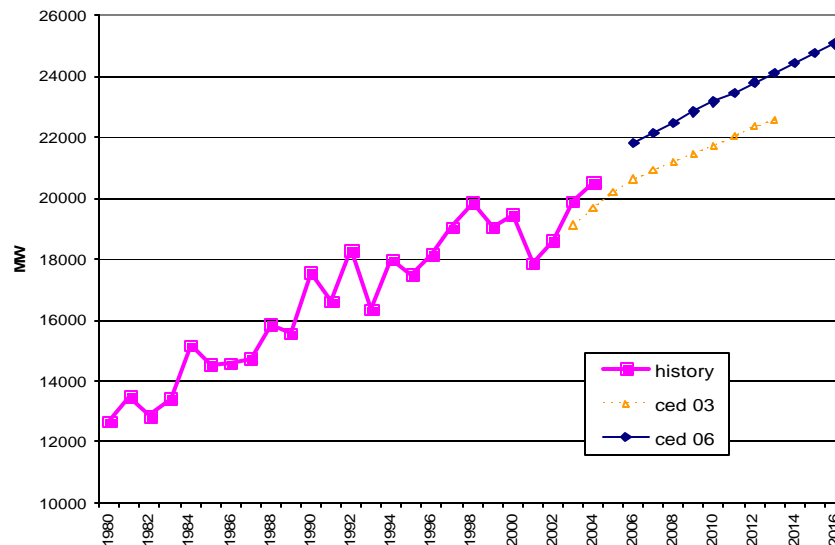
As shown in Figure 3-1, the CED 2006 electricity consumption forecast is about 2.5 percent higher throughout the entire forecast period. This is due to actual 2003 consumption being higher than that projected in the CED 2003 forecast. This increase is, in turn, due to a stronger-than-expected rebound from the 2001 energy crisis and the replacement of statewide economic drivers, used for the CED 2003 forecast, with regional ones. The statewide values masked the fact that the economic downturn in 2001-02 was disproportionately severe in the northern half of the state, resulting in an overstatement of its near-term impacts in southern California in CED 2003. Despite higher forecasted values through 2008 and 2013 in the CED 2006 forecast, Table 3-1 indicates that projected growth is slower than forecasted in CED 2003. This is due to lower long-term population and personal income growth projections as well as the incorporation of the impacts of the recent updates to residential and commercial building and appliance standards.

The CED 2006 SCE planning area peak demand forecast, shown in Figure 3-2, is higher than the CED 2003 forecast over the entire forecast period. This shift up is largely because of the underestimation of 2003 and 2004 demand in CED 2003. Also, the 2004 starting point needs to be adjusted for temperature conditions. Peak temperatures in southern California have been below the 54-year median value since 1998; the temperature at the time of the 2004 peak was roughly 2.5 degrees below the median, “1-in-2” value. The adjustment to reflect the 54-year “average” weather conditions at the time of the annual peak increases the SCE peak load by about 1,000 MW. Other factors which contribute to the increase are the use of new residential and industrial load shapes that more accurately account for air conditioning use over the summer air conditioning period, as well as the previously mentioned peak impact assumptions of the new federal air conditioning appliance standards. While the forecasted peak loads are higher in CED 2006, the rate of growth of peak demand is only slightly higher than the CED 2003 forecast.

**Figure 3-1: SCE Planning Area Electricity Forecast**



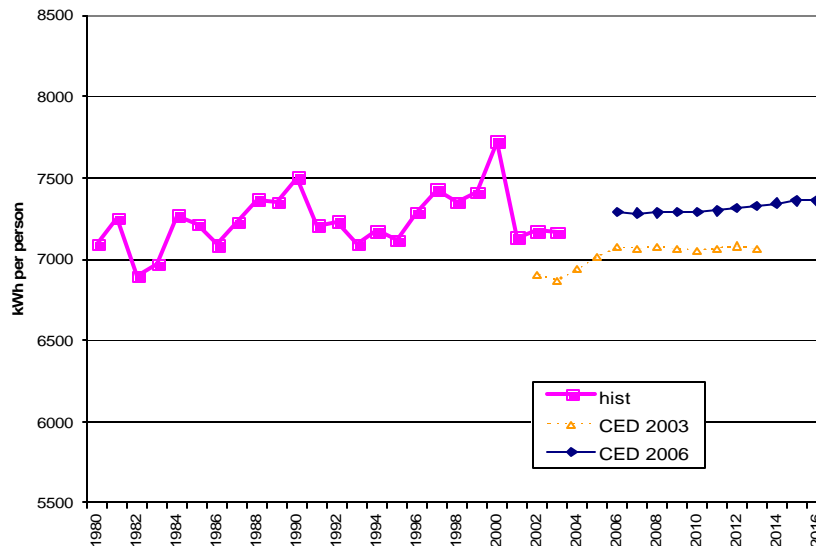
**Figure 3-2: SCE Planning Area Peak**



As Figure 3-3 shows, per capita electricity consumption is higher in the CED 2006 forecast than in the CED 2003. This is due to a greater rebound from the 2001 energy crisis than was anticipated. The level of per capita consumption projected in the CED 2006 forecast increases slightly toward the end of the forecast period, but remains below recent pre-energy crisis per capita consumption levels.

Figure 3-4 provides a comparison of per capita peak demand. The 2004 per capita peak value is higher than was projected by the CED 2003 forecast due to the larger than anticipated rebound from the voluntary conservation effects of the 2000-2001 energy crisis. After accounting for this change in starting point, the CED 2006 per capita peak projection increases slightly over the entire forecast period, reflecting the same pattern of per capita use shown in the electricity consumption forecast.

**Figure 3-3: SCE Planning Area per Capita Electricity Consumption**



**Figure 3-4: SCE Planning Area per Capita Peak Demand**

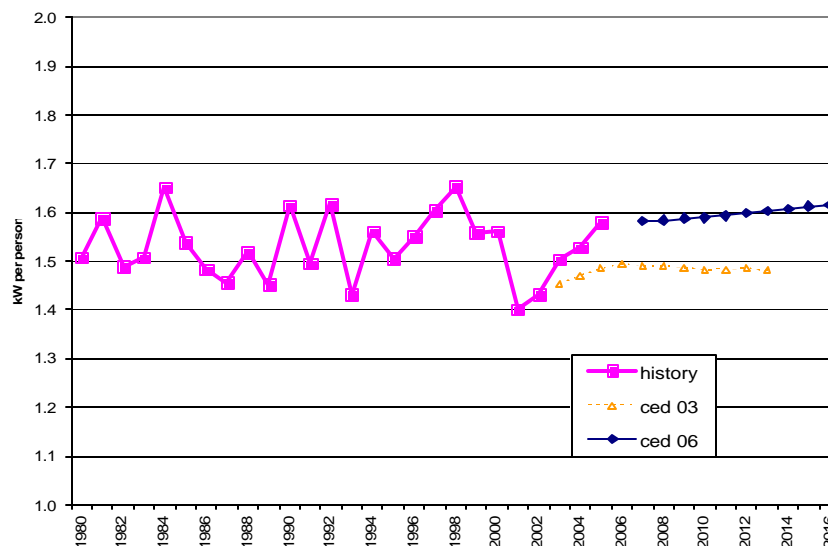
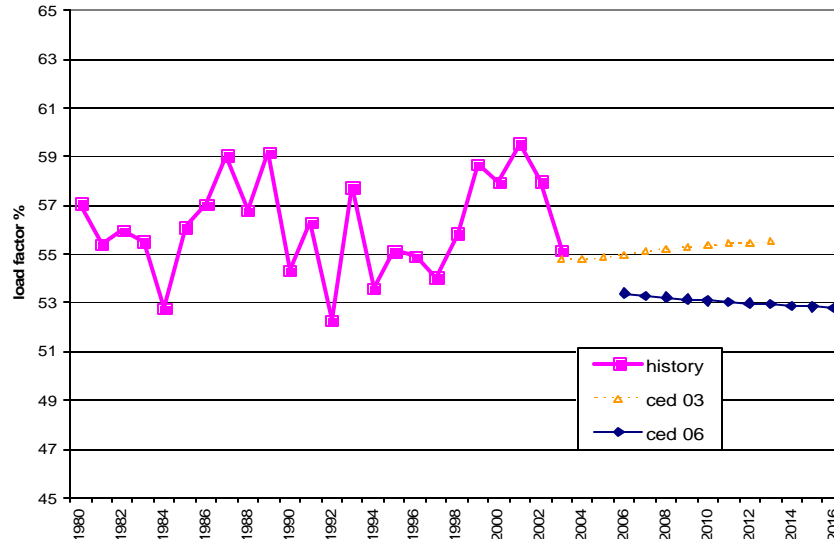


Figure 3-5 compares the load factors for the CED 2003 and CED 2006 forecasts. The load factor is a measure of the relative increase in peak demand with respect to annual electricity consumption. Lower load factors indicate more of a needle peak and higher load factors indicate a more stable load. Historic variation in load factors is caused in part by variation in annual weather patterns. In southern California, recent peak temperatures have been lower than the 54-year median value, resulting in higher-than-expected load factors. The CED 2006 projected load factors are in the range of recent values when the latter are adjusted for weather conditions; the projected load factor is perhaps best viewed relative to that of 1997, the year in the last ten in which peak temperatures were closest to the historical median.

Over the forecast period the CED 2006 load factor declines slightly, which is consistent with higher weather-sensitive load growth in relation to baseload energy growth. Consumption in the SCE planning area is shifting toward residential and commercial sectors and away from the industrial sectors. Growth is also increasingly taking place in hotter inland areas leading to greater saturation of central air conditioning and greater use of air conditioning equipment compared to earlier concentrations in cooler coastal areas. Additionally, air conditioning loads are increasing along the coast as more households are installing air conditioning units for the few days they may be needed each year.

**Figure 3-5: SCE Planning Area Load Factor**





## Sector Level Results and Input Assumptions

### *Residential*

Figure 3-6 provides a comparison of the CED 2006 and CED 2003 SCE planning area residential forecasts. The CED 2006 forecast is higher throughout the entire forecast period, due in large part to a higher 2003 starting point. This starting point difference is a result of the previously discussed energy crisis rebound impact as well as increases in near-term economic and demographic projections. The growth rates of the two forecasts are virtually identical.

**Figure 3-6: SCE Planning Area Residential Consumption**

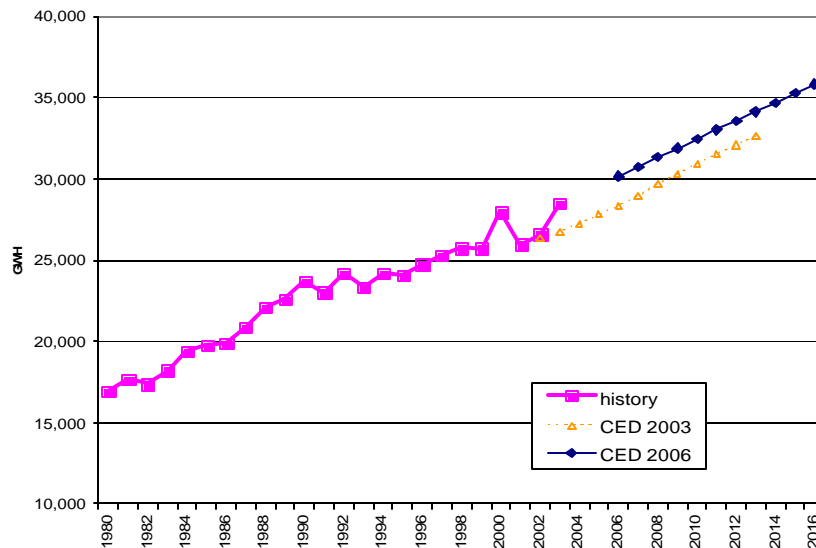
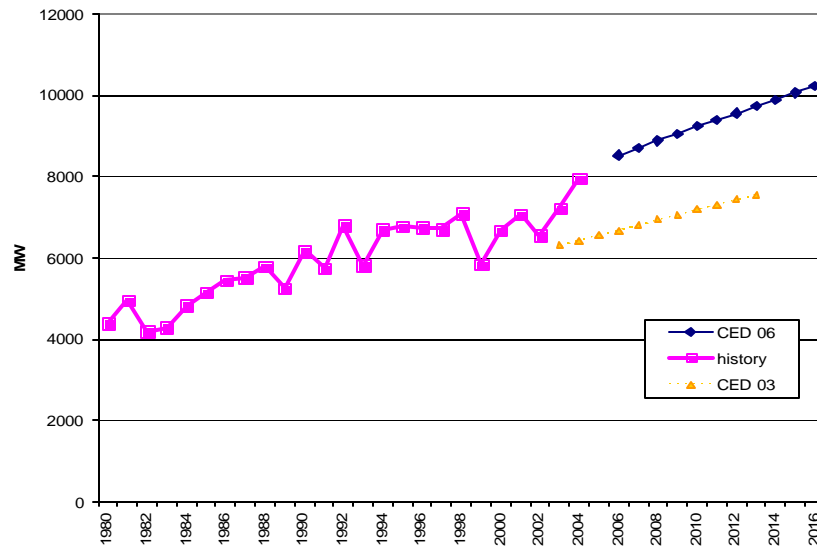


Figure 3-7 provides a comparison of the CED 2006 and CED 2003 residential peak demand forecasts. As is the case for residential consumption, the CED 2006 residential peak forecast is higher than CED 2003. The difference between the two peak forecasts is slightly greater than the difference in the electricity consumption forecasts because the 2005 federal air conditioner standards are assumed to have a greater impact on annual electricity consumption than on peak hour consumption.

**Figure 3-7: SCE Planning Area Residential Peak**



Figures 3-8 and 3-9 provide comparisons of the residential drivers used in the CED 2006 forecast with the CED 2003 values. Figure 3-8 provides comparisons of the total population, total households and persons per household projections. The CED 2006 forecast of total population is lower as it is based on a revised, lower DOF long-term population forecast. Persons per household projections have also been revised upward since CED 2003. The CED 2006 persons per household projections incorporate annual DOF E-5A interim updates to county population and household estimates through 2004. The interim estimates indicate that the level of persons per household in the SCE region has increased at a faster rate than was projected in the CED 2003 forecast. This has increased the current 2004 actual estimate of persons per household. The CED 2006 forecasted growth in persons per household is based on the future growth rate in persons per household being half percent of the annual 1990-2003 growth. This is somewhat higher in the long term than the CED 2003 projection, which leveled off toward the end of the forecast period. The net result is that the CED 2006 long-term household forecast is slightly lower than the CED 2003 long-term forecast.

**Figure 3-8: SCE Planning Area Residential Demographic Projections**

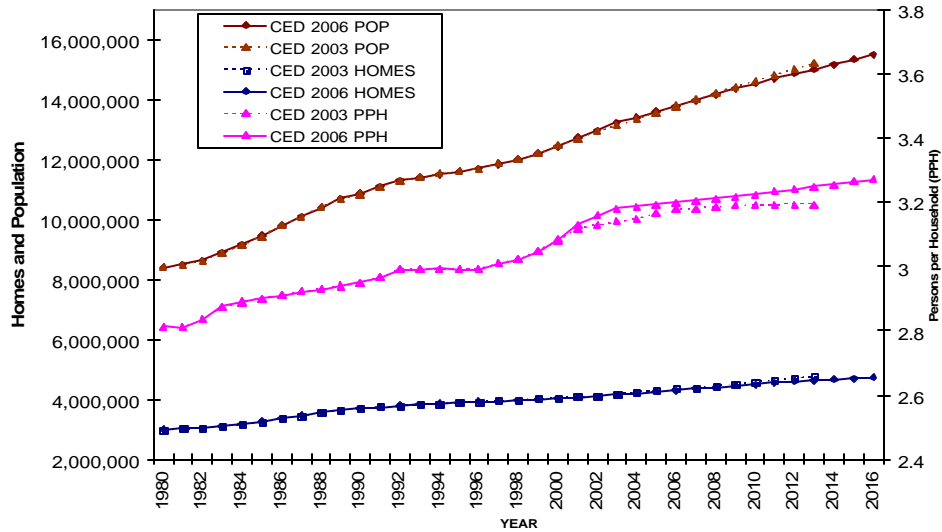


Figure 3-9 provides a comparison of household income between the two forecasts. Household income is derived as the product of per capita income and persons per household. The CED 2006 projection is higher in the short to mid-term because of the increase in household size and, more significantly, the use of regional, rather than statewide economic forecast data. The latter, used for CED 2003, masked the fact that the recent economic downturn was not as severe in the southern half of the state. This higher household income serves to increase forecasted residential consumption in the short term

**Figure 3-9: SCE Planning Area Household Income Projections**

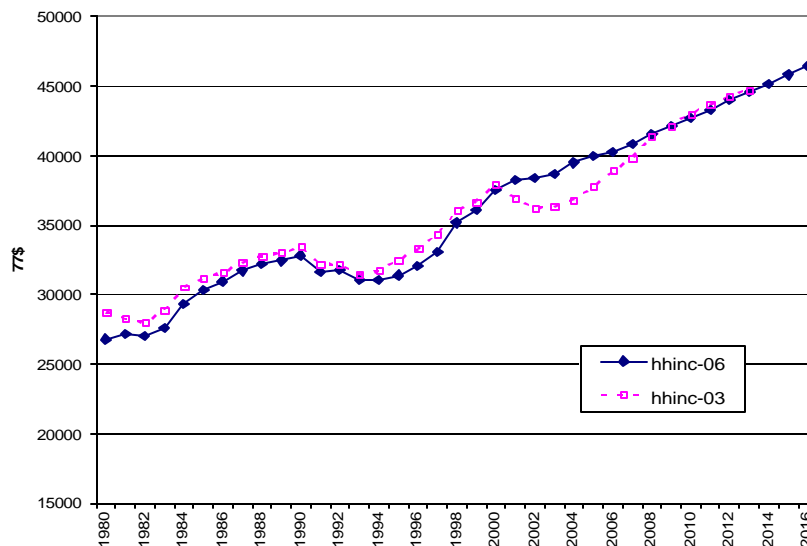
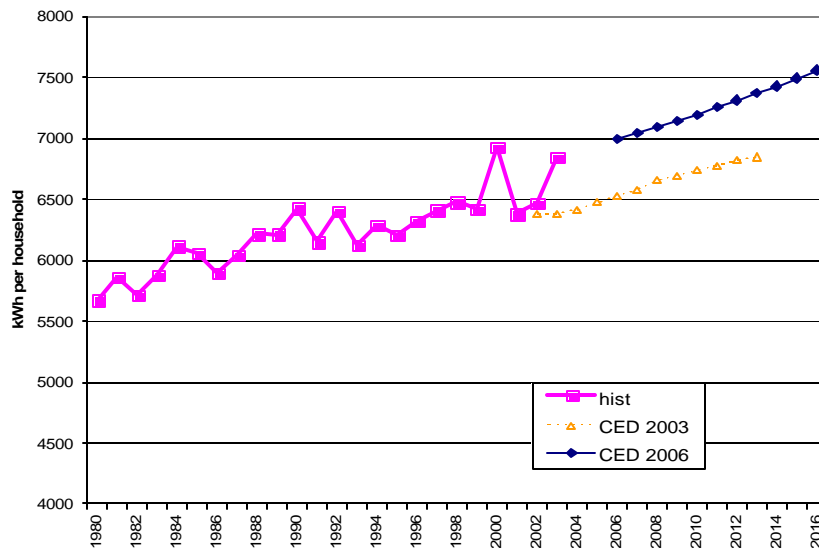


Figure 3-10 presents a comparison of use per household between the two forecasts as well as the 1980-2003 historic series. The CED 2006 forecast of use per household is somewhat higher than that projected in CED 2003. As is the case for several other forecasted values, this is primarily due to a higher historic starting value (2003) than was used in the previous forecast, as well as the higher short term household income projections. The growth rate for use per household forecasted in CED 2006 is similar to the CED 2003 growth rate.

**Figure 3-10: SCE Planning Area Use per Household**



## Commercial Building Sector

Figure 3-11 provides a comparison of the commercial building sector forecasts. The CED 2006 forecast is higher throughout the entire forecast period, in part because CED 2003 under-forecasted short term growth in demand. However, it also reflects uncertainty about the correct attribution of historic data reported by utilities. This issue is discussed in the section on uncertainty and historic data accuracy later in this chapter. The forecasted growth rate of electricity consumption in the commercial sector in CED 2006 is similar to that in CED 2003.

**Figure 3-11: SCE Planning Area Commercial Consumption**

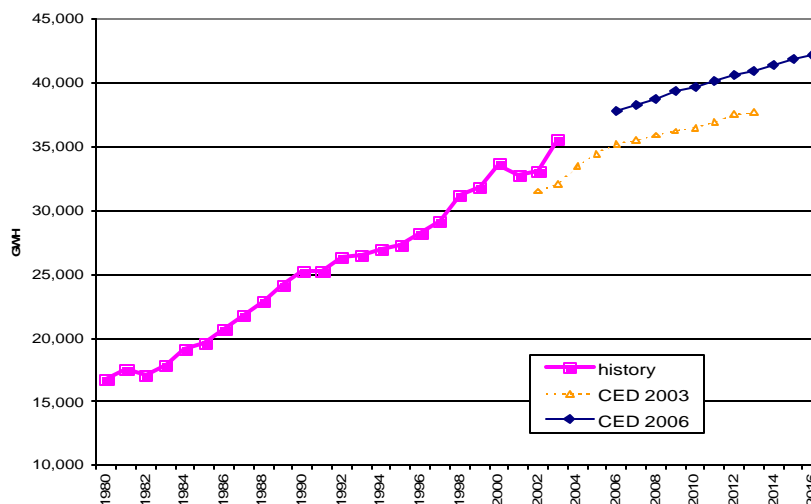
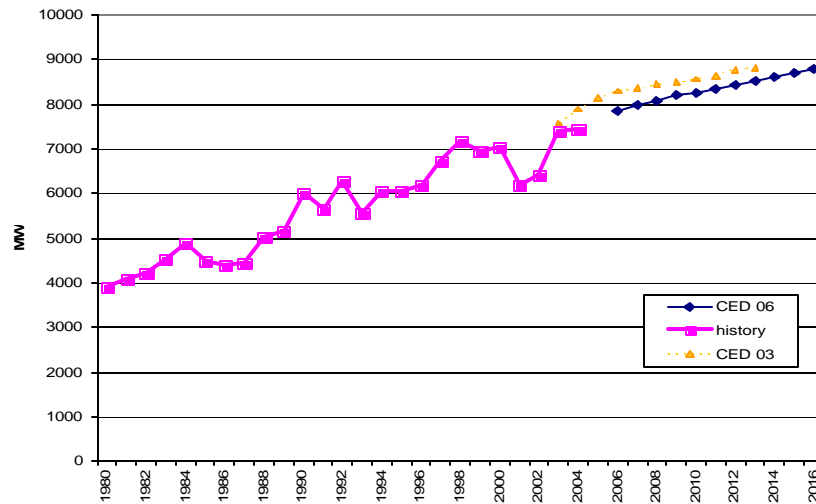


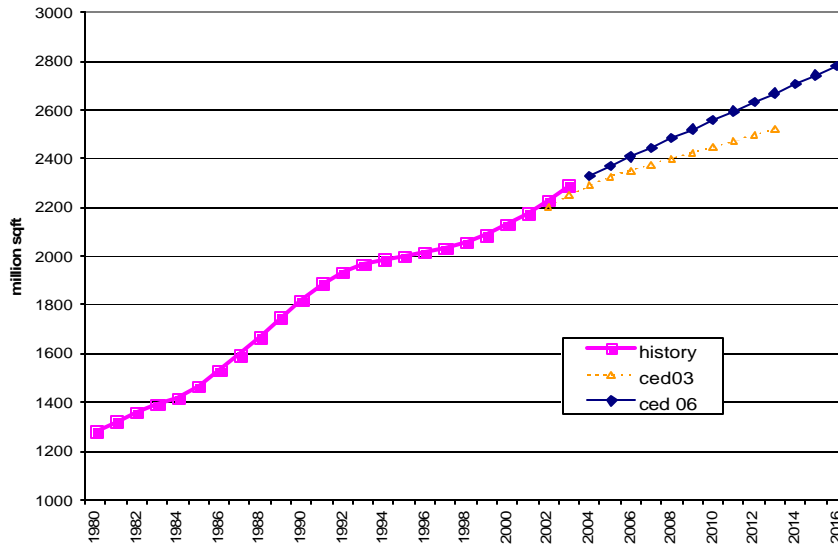
Figure 3-12 provides a comparison of the commercial peak demand forecasts. Growth in the respective commercial peak demand forecasts are driven primarily by the underlying electricity consumption forecast and exhibit the same patterns. In contrast to the consumption forecast, the CED 2006 commercial peak starting value is lower than the CED 2003 value due to revisions in load shapes used to drive the peak forecast and calibration to actual annual sector load data. These revisions caused the new commercial contribution to total system peak to be lower than previously projected. The estimate of commercial weather-sensitive load decreased to 16 percent of annual system peak, from 18 percent in CED 2003.

**Figure 3-12: SCE Planning Area Commercial Sector Peak**



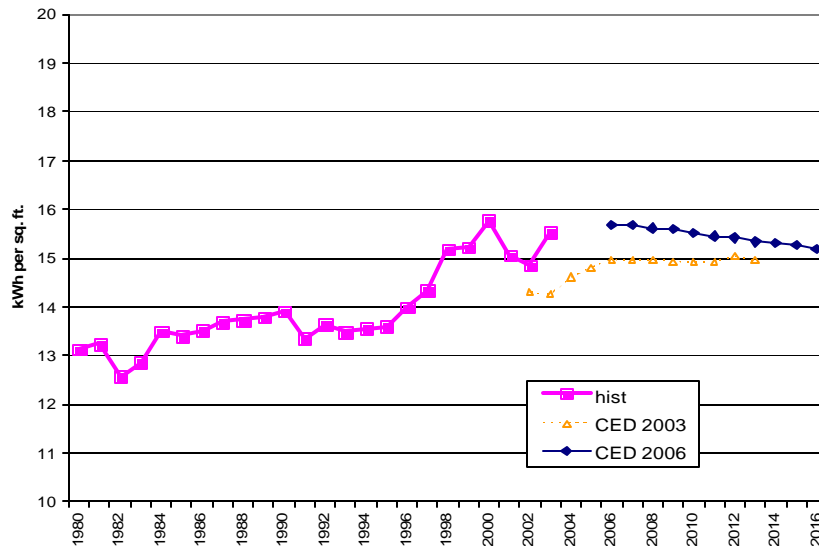
In staff's commercial building sector forecasting model, floorspace by building type (e.g. retail, schools, offices, etc.) is the key driver for energy consumption and peak demand. Figure 3-13 provides a comparison of total commercial floorspace projections. The CED 2006 floorspace projections are higher throughout the forecast period than those projected in CED 2003.

**Figure 3-13: SCE Planning Area Commercial Floorspace**



The impact of increased floorspace projections is somewhat offset by a decline in projected use per square foot over the forecast period, shown in Figure 3-14. This decline in use per square foot is a result of impacts of the 1998 through 2005 iterations of the commercial building and appliance standards.

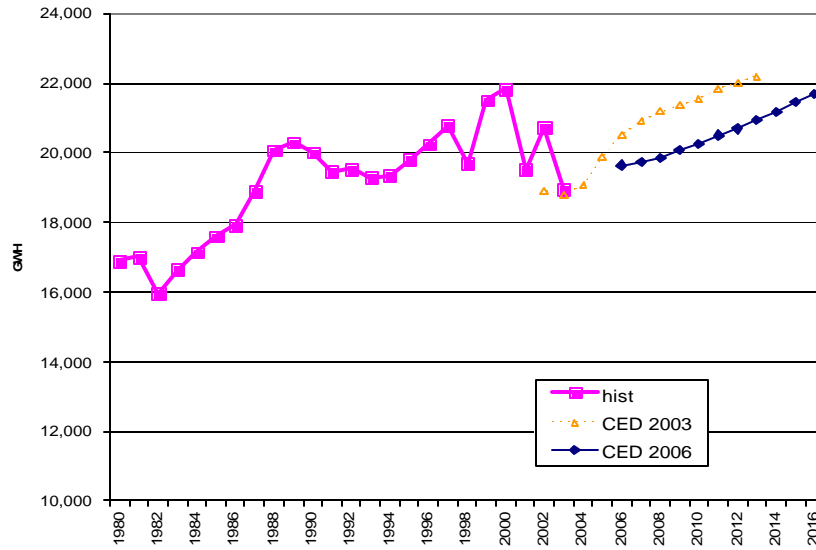
**Figure 3-14: SCE Planning Area Commercial kWh per Square Foot**



## ***Industrial***

Figure 3-15 provides comparisons of the forecasts industrial sector electricity consumption for the SCE planning area. The CED 2006 forecast is lower throughout the entire forecast period, primarily due to its lower (2003) starting point. This is essentially the opposite of the commercial building sector forecast comparisons and may be due to the recent increase in “unclassified” energy consumption reported by LSEs and the method of allocation of that consumption to the various nonresidential sectors. Figure 3-16 provides a comparison of the industrial sector peak forecasts. As is the case for the electricity consumption forecasts, the CED 2006 forecast starts from a lower initial 2003 value and remains below the CED 2003 forecast throughout the forecast period. The CED 2003 and CED 2006 industrial peak forecast growth rates are nearly identical.

**Figure 3-15: SCE Planning Area Industrial Consumption**



**Figure 3-16: SCE Planning Area Industrial Sector Peak**

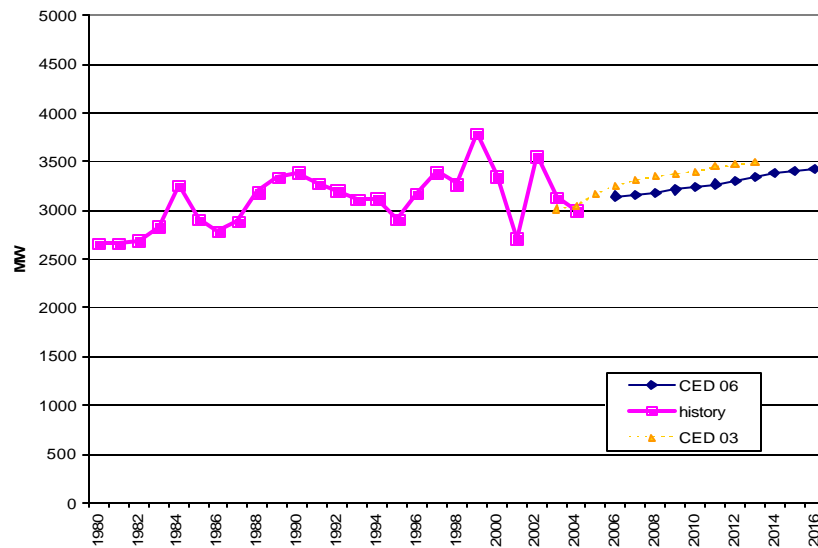
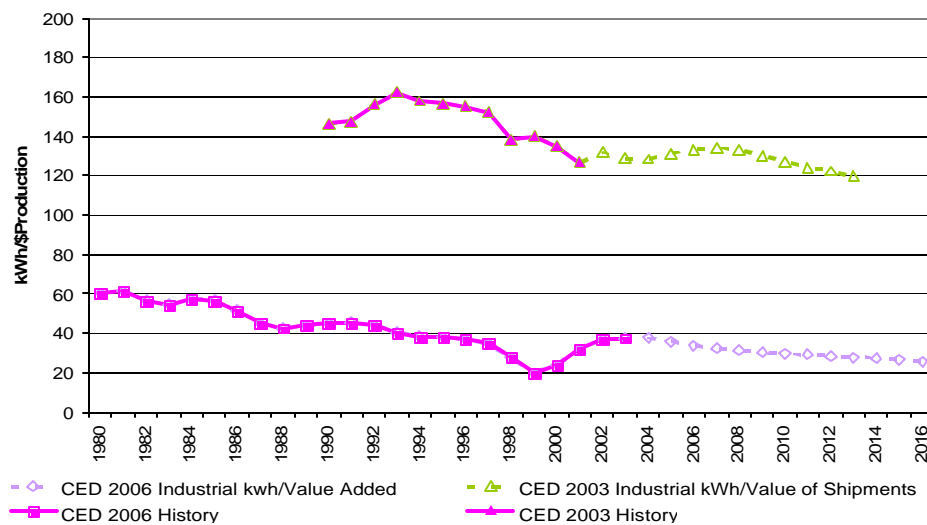




Figure 3-17 provides a comparison of use per dollar value of production between the CED 2006 and CED 2003 forecasts. The CED 2003 forecast used value of shipments provided by the UCLA Anderson School of Business. The CED 2006 forecast uses value added projections provided by Economy.com in October, 2004. Whereas the former consisted of statewide values, the latter were developed at the county level. It is apparent from the historical county level economic drivers that there are major differences in economic activity in the various regions of California. While acknowledgement of different patterns of economic activity in the separate utility planning areas was not considered critical prior to enactment of SB 1389, and thus for the CED 2003, with the resumption of planning area-based energy assessments in this 2005 *Energy Report* cycle the staff has returned to preparing economic/demographic projections tailored to the various sub-regions of the state.

Electricity use per dollar of value added in the industrial sector is projected to decline slowly over the forecast period. This is in contrast to CED 2003 forecast, which projected a stable value in the short term and a decline during the post 2008 period.

**Figure 3-17: SCE Planning Area Industrial Use per Production Unit**

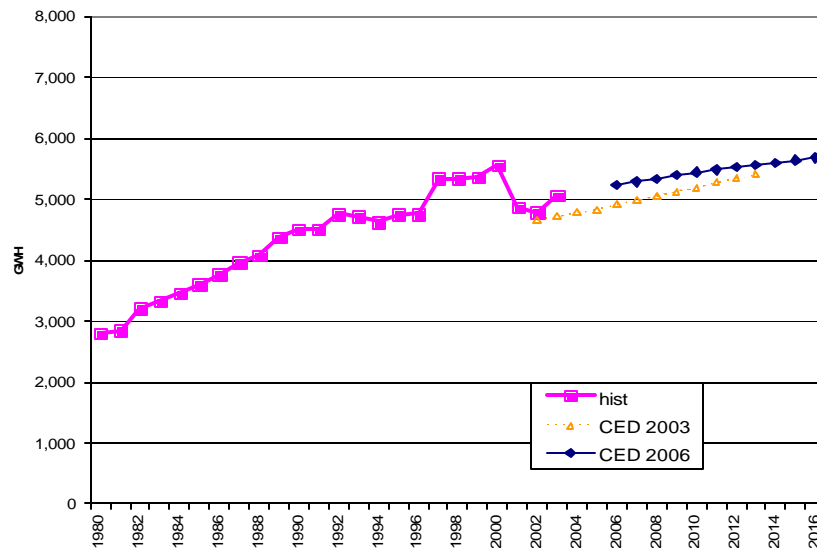


## Other Sectors

Figures 3-18 and 3-19 provide comparisons of the consumption forecasts for the remaining sectors. Figure 3-18 provides a comparison of the transportation, communication and utilities (TCU) sector forecasts. The CED 2006 TCU forecast is higher than that of CED 2003 due to a higher historical starting point. The CED 2006 forecasted growth rate is lower due to the lower forecasted population growth rate.<sup>1</sup> Figure 3-19 provides comparisons of the forecasts for the agriculture and water pumping and mining and oil extraction sectors. The CED 2006 forecast for agriculture and water pumping is lower than the CED 2003 forecast due to lower

assumed starting point. The low 2003 historic value is due to a partial year shut down of Metropolitan Water District pumping facilities for repairs. There is little difference between the CED 2006 and CED 2003 mining and oil extraction forecasts.

**Figure 3-18: SCE Planning Area Transportation, Communication & Utilities Sector Electricity Consumption**



**Figure 3-19: SCE Planning Area Agriculture & Water Pumping and Mining & Oil Extraction Electricity Consumption Forecasts**

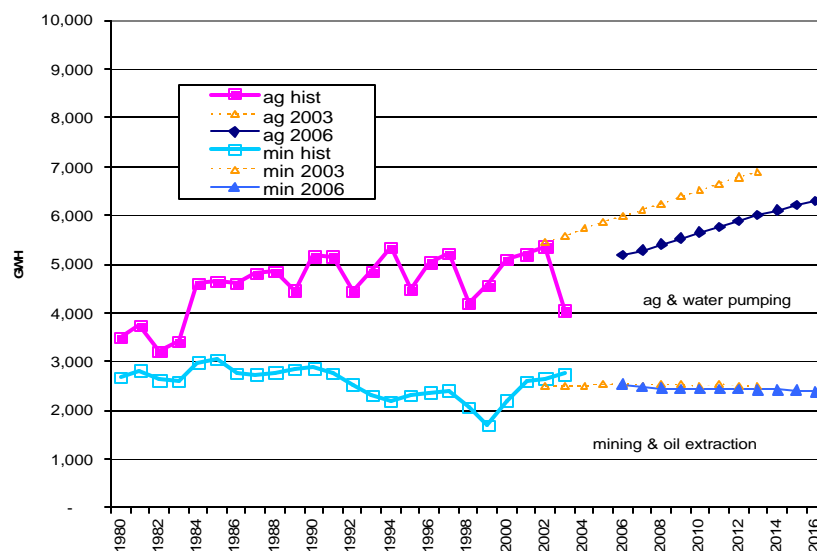
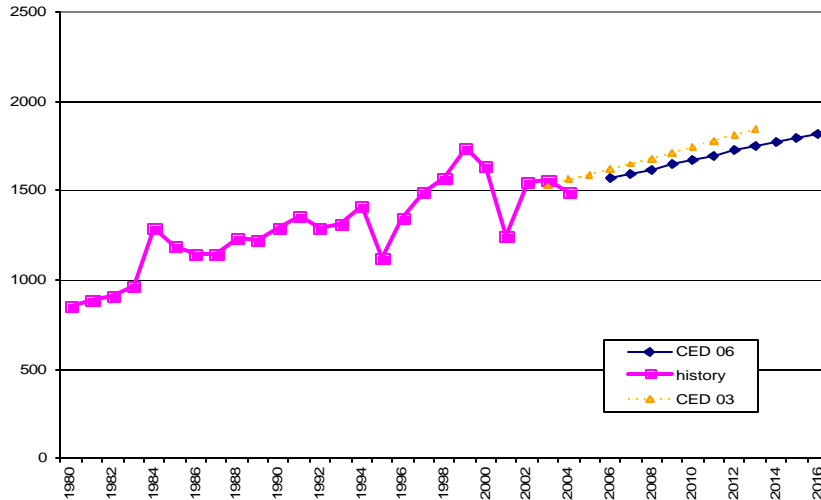


Figure 3-20 provides a comparison of the combined Other Sector peaks for the CED 2006 and CED 2003 forecasts. The CED 2006 forecast is lower over the entire forecast period than the CED 2003 due to a lower historical starting point. However,

the growth rate of the CED 2006 forecast is higher than that of the CED 2003 forecast.

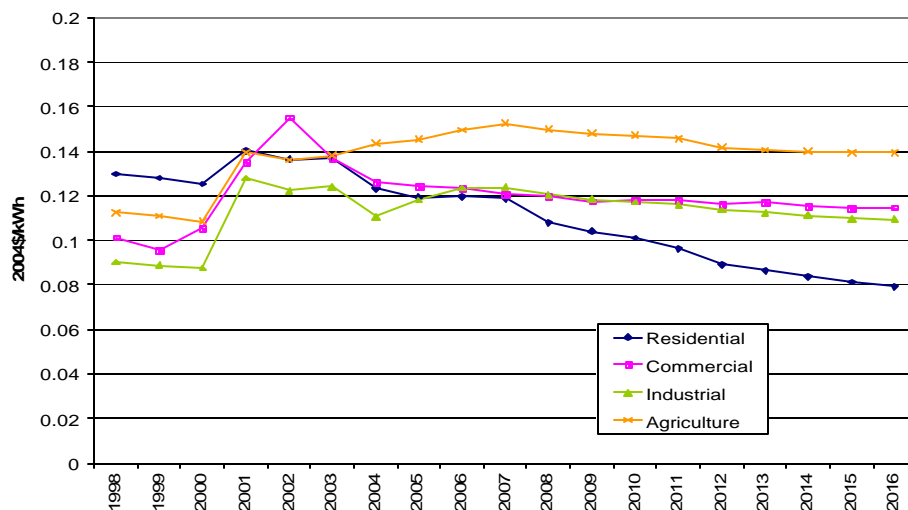
**Figure 3-20: SCE Planning Area Other Sector Peak**



## Electricity Prices

Figure 3-21 shows the sector prices used in the CED 2006 forecast for the SCE planning area. These electricity prices are based on information provided by each of the LSEs in the planning area.<sup>2</sup> The planning area prices represent a weighted average of SCE service area, municipal utility and ESP price projections by customer class.

**Figure 3-21: SCE Planning Area Prices**



## Uncertainty Introduced by Historic Data Inaccuracy

Pursuant to QFER regulations, LSEs are required to report electricity consumption by sector to the Energy Commission. Recently, an increasing share of consumption has been reported as “unclassified” (see Figure 3-22). In the absence of additional information, this consumption is allocated to the industrial, commercial and TCU sectors proportional to classified sales. If the actual sector distribution of unclassified electricity use is different than the distribution of properly classified electricity, the forecast will be adversely affected. For example, as commercial and industrial customers have substantially different load shapes misclassifying consumption could result in erroneous estimation of sector consumption, peak demand, and growth rates.

**Figure 3-22: SCE Planning Area Unclassified Sales**

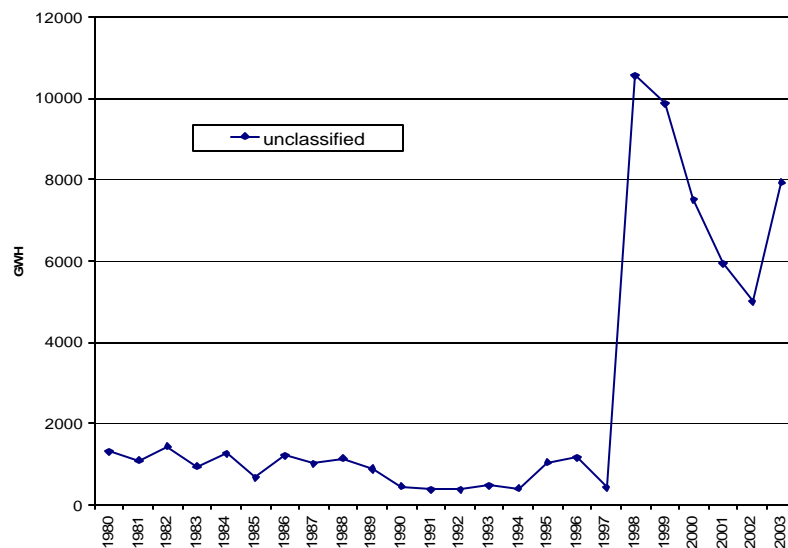
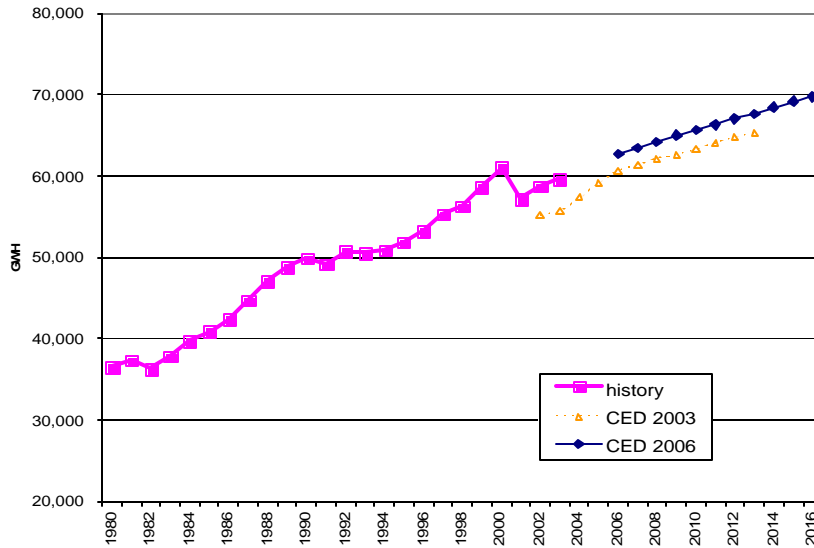


Figure 3-23 provides a comparison of the CED 2006 and CED 2003 forecasts at a more aggregate nonresidential level of detail. This figure indicates that there is much less of a “starting point difference” than at each sector specific level of detail. Nevertheless, the staff believes that the failure to adequately classify an increasing share of consumption is serious reporting problem. Accurate classification of consumption provides a foundation for the implementation of efficiency and demand response programs as well as many other policy decisions. There needs to be a concerted effort on the part of all parties to this process to provide accurate consumption information if we are to understand how and where energy is being used.

**Figure 3-23: SCE Planning Area Nonresidential Electricity  
(Commercial, Industrial, TCU and Streetlighting)**



<sup>1</sup> Because of lack of accurate historical data the TCU sector was forecasted at a sector level using population as the driver, In CED 2003, the forecast entailed aggregating consumption estimates for each of the individual SIC codes that make up the TCU sector, developed using the appropriate economic and demographic drivers.

<sup>2</sup> All LSEs >200MW peak demand were required to provide electricity price projections by customer sector pursuant to GENERAL INSTRUCTIONS: RETAIL ELECTRICITY PRICE FORECAST ELECTRICITY DATA REQUEST 2003-2016 adopted by Commissioner order, November 3, 2004.

**Form 1.1 - SCE Planning Area**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Electricity Consumption by Sector (GWh)**

Year	Residential	Commercial	Industrial	Mining	Agricultural	TCU	Streetlighting	Total Consumption
1980	16,965	16,799	16,893	2,681	3,496	2,174	637	59,644
1981	17,710	17,496	17,005	2,818	3,749	2,233	621	61,632
1982	17,389	17,086	15,971	2,628	3,226	2,497	707	59,504
1983	18,205	17,888	16,651	2,596	3,418	2,677	652	62,087
1984	19,395	19,126	17,131	2,988	4,611	2,834	618	66,704
1985	19,751	19,635	17,590	3,041	4,661	2,974	633	68,286
1986	19,877	20,678	17,925	2,771	4,618	3,148	618	69,635
1987	20,894	21,837	18,899	2,738	4,811	3,315	651	73,144
1988	22,124	22,927	20,072	2,776	4,861	3,490	595	76,843
1989	22,620	24,100	20,312	2,837	4,465	3,770	609	78,711
1990	23,684	25,308	20,028	2,871	5,173	3,884	632	81,579
1991	23,039	25,227	19,464	2,753	5,160	3,871	632	80,145
1992	24,210	26,398	19,539	2,530	4,456	4,080	678	81,890
1993	23,362	26,504	19,294	2,306	4,864	4,056	666	81,051
1994	24,190	26,916	19,347	2,198	5,348	3,969	659	82,628
1995	24,097	27,225	19,818	2,313	4,475	4,138	616	82,682
1996	24,738	28,219	20,257	2,370	5,042	4,125	633	85,384
1997	25,270	29,160	20,793	2,413	5,225	4,702	647	88,210
1998	25,749	31,220	19,705	2,078	4,191	4,669	677	88,288
1999	25,726	31,779	21,512	1,690	4,570	4,720	650	90,646
2000	27,980	33,627	21,835	2,207	5,105	4,893	673	96,319
2001	25,970	32,773	19,529	2,595	5,213	4,166	700	90,948
2002	26,586	33,149	20,740	2,662	5,369	4,084	706	93,297
2003	28,488	35,602	18,947	2,750	4,051	4,371	700	94,909
2006	30,172	37,728	19,744	2,536	5,192	4,516	714	100,602
2007	30,717	38,325	19,855	2,485	5,286	4,566	719	101,951
2008	31,317	38,772	20,060	2,459	5,408	4,614	724	103,354
2009	31,899	39,326	20,266	2,447	5,531	4,663	728	104,860
2010	32,485	39,684	20,500	2,442	5,655	4,712	732	106,210
2011	33,024	40,102	20,683	2,438	5,768	4,749	735	107,499
2012	33,578	40,585	20,923	2,433	5,891	4,786	739	108,936
2013	34,122	40,933	21,183	2,428	6,002	4,823	742	110,233
2014	34,668	41,403	21,466	2,425	6,107	4,859	744	111,672
2015	35,255	41,883	21,671	2,411	6,207	4,895	747	113,069
2016	35,837	42,209	21,822	2,386	6,296	4,931	750	114,230

**Annual Growth Rates (%)**

1980-1990	3.4	4.2	1.7	0.7	4.0	6.0	-0.1	3.2
1990-2000	1.7	2.9	0.9	-2.6	-0.1	2.3	0.6	1.7
2000-2003	0.6	1.9	-4.6	7.6	-7.4	-3.7	1.3	-0.5
2003-2008	1.9	1.7	1.1	-2.2	6.0	1.1	0.7	1.7
2008-2016	1.7	1.1	1.1	-0.4	1.9	0.8	0.4	1.3
2003-2016	1.8	1.3	1.1	-1.1	3.5	0.9	0.5	1.4

**Form 1.1b - SCE**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Electricity Sales by Sector (GWh)**

Year	Residential	Commercial	Industrial	Mining	Agricultural	TCU	Streetlighting	Total Consumption
1980	16,965	16,799	16,893	2,681	3,496	2,174	637	59,644
1981	17,710	17,496	17,005	2,818	3,749	2,233	621	61,632
1982	17,389	17,086	15,971	2,628	3,226	2,497	707	59,504
1983	18,205	17,888	16,651	2,596	3,418	2,677	652	62,087
1984	19,395	19,126	17,131	2,988	4,611	2,834	618	66,704
1985	19,751	19,635	17,590	3,041	4,661	2,974	633	68,286
1986	19,877	20,678	17,925	2,771	4,618	3,148	618	69,635
1987	20,894	21,837	18,899	2,738	4,811	3,315	651	73,144
1988	22,124	22,927	20,072	2,776	4,861	3,490	595	76,843
1989	22,620	24,100	20,312	2,837	4,465	3,770	609	78,711
1990	23,684	25,308	20,028	2,871	5,173	3,884	632	81,579
1991	23,039	25,227	19,464	2,753	5,160	3,871	632	80,145
1992	24,210	26,398	19,539	2,530	4,456	4,080	678	81,890
1993	23,362	26,504	19,294	2,306	4,864	4,056	666	81,051
1994	24,190	26,916	19,347	2,198	5,348	3,969	659	82,628
1995	24,097	27,225	19,818	2,313	4,475	4,138	616	82,682
1996	24,738	28,219	20,257	2,370	5,042	4,125	633	85,384
1997	25,270	29,160	20,793	2,413	5,225	4,702	647	88,210
1998	25,749	31,220	19,705	2,078	4,191	4,669	677	88,288
1999	25,726	31,779	21,512	1,690	4,570	4,720	650	90,646
2000	27,980	33,627	21,835	2,207	5,105	4,893	673	96,319
2001	25,970	32,773	19,529	2,595	5,213	4,166	700	90,948
2002	26,586	33,149	20,740	2,662	5,369	4,084	706	93,297
2003	28,488	35,602	18,947	2,750	4,051	4,371	700	94,909
2006	30,172	37,566	16,447	1,199	5,192	4,192	714	95,482
2007	30,717	38,160	16,501	1,126	5,286	4,236	719	96,744
2008	31,317	38,606	16,669	1,084	5,408	4,281	724	98,088
2009	31,899	39,157	16,830	1,055	5,531	4,325	728	99,527
2010	32,485	39,514	17,029	1,036	5,655	4,371	732	100,821
2011	33,024	39,930	17,176	1,017	5,768	4,405	735	102,056
2012	33,578	40,411	17,375	995	5,891	4,438	739	103,428
2013	34,122	40,758	17,600	975	6,002	4,471	742	104,670
2014	34,668	41,225	17,840	956	6,107	4,503	744	106,044
2015	35,255	41,703	18,007	926	6,207	4,535	747	107,382
2016	35,837	42,028	18,132	890	6,296	4,568	750	108,500

**Annual Growth Rates (%)**

1980-1990	3.4	4.2	1.7	0.7	4.0	6.0	-0.1	3.2
1990-2000	1.7	2.9	0.9	-2.6	-0.1	2.3	0.6	1.7
2000-2003	0.6	1.9	-4.6	7.6	-7.4	-3.7	1.3	-0.5
2003-2008	1.9	1.6	-2.5	-17.0	6.0	-0.4	0.7	0.7
2008-2016	1.7	1.1	1.1	-2.4	1.9	0.8	0.4	1.3
2003-2016	1.8	1.3	-0.3	-8.3	3.5	0.3	0.5	1.0

**Form 1.2 - SCE**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Net Energy for Load (GWh)**

	Total Consumption	Net Losses	Gross Generation	Private Supply	Net Energy for Load
1980	59,644	4,036	63,680	289	63,391
1981	61,632	4,171	65,803	296	65,507
1982	59,504	4,013	63,517	492	63,025
1983	62,087	4,160	66,247	914	65,333
1984	66,704	4,461	71,164	1,103	70,061
1985	68,286	4,556	72,842	1,286	71,555
1986	69,635	4,638	74,273	1,428	72,845
1987	73,144	4,852	77,996	1,790	76,205
1988	76,843	5,020	81,864	3,019	78,845
1989	78,711	5,135	83,846	3,199	80,648
1990	81,579	5,322	86,901	3,308	83,593
1991	80,145	5,221	85,367	3,362	82,005
1992	81,890	5,337	87,227	3,408	83,818
1993	81,051	5,272	86,323	3,522	82,801
1994	82,628	5,377	88,004	3,558	84,446
1995	82,682	5,380	88,063	3,558	84,505
1996	85,384	5,562	90,946	3,589	87,357
1997	88,210	5,736	93,947	3,854	90,092
1998	94,803	6,187	100,991	3,815	97,176
1999	95,607	6,239	101,847	3,851	97,995
2000	96,319	6,293	102,612	3,776	98,835
2001	90,948	5,933	96,881	3,701	93,179
2002	93,297	6,020	99,317	4,761	94,556
2003	94,909	6,123	101,032	4,864	96,168
2006	100,602	6,493	107,095	5,120	101,975
2007	101,951	6,579	108,530	5,207	103,323
2008	103,354	6,670	110,024	5,266	104,758
2009	104,860	6,768	111,627	5,333	106,294
2010	106,210	6,856	113,066	5,389	107,677
2011	107,499	6,940	114,439	5,444	108,995
2012	108,936	7,033	115,969	5,508	110,461
2013	110,233	7,118	117,350	5,563	111,787
2014	111,672	7,211	118,883	5,629	113,255
2015	113,069	7,302	120,371	5,688	114,684
2016	114,230	7,378	121,608	5,730	115,878

**Annual Growth Rates (%)**

1980-1990	3.2	2.8	3.2	27.6	2.8
1990-2000	1.7	1.7	1.7	1.3	1.7
2000-2003	-0.5	-0.9	-0.5	8.8	-0.9
2003-2008	1.7	1.7	1.7	1.6	1.7
2008-2016	1.3	1.3	1.3	1.1	1.3
2003-2016	1.4	1.4	1.4	1.3	1.4



**Form 1.3 - SCE Planning Area**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Coincident Peak Demand by Sector (MW)**

Year	Residential		Commercial		Industrial			Total Industrial	Agr.	TCU & Street-lighting	Total
	Base Load	Weather Sensitive	Base Load	Weather Sensitive	Process	Assembly	Mining				
1990	3,321	2,859	3,790	2,231	964	2,004	418	3,387	752	539	16,879
1991	2,992	2,745	3,598	2,047	1,008	1,868	397	3,273	766	597	16,017
1992	3,414	3,387	3,793	2,494	1,009	1,844	349	3,202	678	618	17,585
1993	2,938	2,884	3,650	1,902	984	1,811	320	3,115	695	615	15,799
1994	3,427	3,287	3,848	2,205	1,060	1,765	299	3,124	813	605	17,311
1995	3,055	3,720	3,710	2,340	884	1,724	301	2,909	585	541	16,860
1996	3,429	3,320	3,964	2,238	1,035	1,826	317	3,178	736	615	17,480
1997	3,582	3,135	4,179	2,549	1,053	2,004	337	3,395	779	718	18,338
1998	3,496	3,603	4,345	2,824	932	2,019	320	3,271	790	776	19,104
1999	3,919	1,938	4,881	2,083	1,107	2,395	291	3,792	879	865	18,356
2000	4,148	2,551	4,540	2,500	1,029	2,001	323	3,353	836	797	18,724
2001	3,467	3,621	3,830	2,347	819	1,554	339	2,712	704	546	17,227
2002	3,840	2,719	4,345	2,085	1,168	1,970	420	3,558	855	694	18,096
2003	3,553	3,674	4,434	2,962	1,051	1,666	416	3,132	825	737	19,318
2004	3,448	4,505	4,323	3,136	1,017	1,595	386	2,998	782	706	19,900
2006	3,685	4,852	4,554	3,311	1,066	1,704	376	3,146	826	745	21,120
2007	3,755	4,952	4,626	3,361	1,066	1,720	369	3,155	840	753	21,442
2008	3,831	5,055	4,679	3,399	1,070	1,745	366	3,181	860	761	21,765
2009	3,905	5,159	4,746	3,445	1,075	1,769	365	3,209	879	769	22,112
2010	3,980	5,265	4,788	3,476	1,085	1,793	365	3,242	898	777	22,426
2011	4,048	5,356	4,838	3,511	1,090	1,813	365	3,268	916	783	22,721
2012	4,119	5,450	4,896	3,553	1,100	1,837	365	3,301	937	789	23,044
2013	4,188	5,544	4,937	3,583	1,111	1,862	365	3,338	954	795	23,339
2014	4,257	5,641	4,994	3,623	1,124	1,888	365	3,377	971	801	23,663
2015	4,331	5,738	5,052	3,664	1,133	1,908	363	3,405	986	807	23,982
2016	4,404	5,836	5,090	3,692	1,139	1,924	360	3,423	1,000	813	24,257

**Annual Growth Rates (%)**

1980-1990	4.8	2.1	4.8	3.7	2.1	2.7	1.8	2.5	3.7	5.1	3.6
1990-2000	2.2	-1.1	1.8	1.1	0.7	0.0	-2.6	-0.1	1.1	4.0	1.0
2000-2001	-16.4	42.0	-15.6	-6.1	-20.4	-22.3	4.9	-19.1	-15.8	-31.5	-8.0
2000-2003	-5.0	12.9	-0.8	5.8	0.7	-5.9	8.8	-2.2	-0.4	-2.6	1.0
2003-2008	1.5	6.6	1.1	2.8	0.4	0.9	-2.5	0.3	0.8	0.7	2.4
2008-2016	1.8	1.8	1.1	1.0	0.8	1.2	-0.2	0.9	1.9	0.8	1.4
2003-2016	1.7	3.6	1.1	1.7	0.6	1.1	-1.1	0.7	1.5	0.8	1.8

**Form 1.4 - SCE Planning Area**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Peak Demand (MW)**

Year	Total End Use Load	Net Losses	Gross Generation	Private Supply	Net Peak Demand	Load Factor (%)
1980	11,829	895	12,724	48	12,676	57.1
1981	12,592	953	13,545	50	13,495	55.4
1982	12,029	908	12,937	83	12,854	56.0
1983	12,638	949	13,587	153	13,433	55.5
1984	14,271	1,071	15,342	185	15,157	52.8
1985	13,743	1,028	14,771	216	14,555	56.1
1986	13,783	1,029	14,812	240	14,572	57.1
1987	13,993	1,041	15,034	301	14,734	59.0
1988	15,234	1,119	16,353	507	15,846	56.8
1989	14,991	1,098	16,089	537	15,552	59.2
1990	16,879	1,241	18,119	555	17,564	54.3
1991	16,017	1,174	17,191	564	16,627	56.3
1992	17,585	1,293	18,878	572	18,306	52.3
1993	15,799	1,156	16,955	591	16,364	57.8
1994	17,311	1,270	18,581	597	17,983	53.6
1995	16,860	1,236	18,095	597	17,498	55.1
1996	17,480	1,283	18,763	602	18,160	54.9
1997	18,338	1,344	19,682	647	19,035	54.0
1998	19,104	1,403	20,507	640	19,867	55.8
1999	18,356	1,346	19,702	647	19,056	58.7
2000	18,724	1,375	20,099	634	19,465	58.0
2001	17,227	1,262	18,489	621	17,868	59.5
2002	18,096	1,315	19,410	799	18,611	58.0
2003	19,318	1,406	20,724	817	19,907	55.1
2004	19,900	1,449	21,349	830	20,519	55.4
2006	21,120	1,540	22,660	859	21,800	53.4
2007	21,442	1,563	23,005	874	22,131	53.3
2008	21,765	1,587	23,352	884	22,468	53.2
2009	22,112	1,612	23,725	895	22,829	53.2
2010	22,426	1,636	24,061	905	23,156	53.1
2011	22,721	1,657	24,379	914	23,465	53.0
2012	23,044	1,681	24,726	925	23,801	53.0
2013	23,339	1,703	25,042	934	24,108	52.9
2014	23,663	1,727	25,390	945	24,445	52.9
2015	23,982	1,750	25,732	955	24,777	52.8
2016	24,257	1,770	26,028	962	25,066	52.8

**Annual Growth Rates (%)**

1990-2000	1.0	1.0	1.0	1.3	1.0
2000-2001	-8.0	-8.2	-8.0	-2.0	-8.2
2000-2003	1.0	0.8	1.0	8.8	0.8
2003-2008	2.4	2.4	2.4	1.6	2.4
2008-2016	1.4	1.4	1.4	1.1	1.4
2003-2016	1.8	1.8	1.8	1.3	1.8

**Form 1.5 - SCE Planning Area**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Noncoincident Peak Demand Temperature Scenarios**

Year	1-in-2 Temperatures	1-in-5 Temperatures	1-in-10 Temperatures	1-in-20 Temperatures	1-in-5 Multiplier	1-in-10 Multiplier	1-in-20 Multiplier
2006	21,800	22,745	23,325	23,720	1.043	1.070	1.088
2007	22,131	23,090	23,679	24,080	1.043	1.070	1.088
2008	22,468	23,442	24,040	24,447	1.043	1.070	1.088
2009	22,829	23,819	24,426	24,840	1.043	1.070	1.088
2010	23,156	24,160	24,776	25,196	1.043	1.070	1.088
2011	23,465	24,482	25,106	25,532	1.043	1.070	1.088
2012	23,801	24,832	25,466	25,897	1.043	1.070	1.088
2013	24,108	25,153	25,794	26,231	1.043	1.070	1.088
2014	24,445	25,504	26,155	26,598	1.043	1.070	1.088
2015	24,777	25,851	26,510	26,960	1.043	1.070	1.088
2016	25,066	26,152	26,819	27,274	1.043	1.070	1.088

**Form 1.7a - SCE**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Private Supply by Sector (GWh)**

Year	Residential	Commercial	Industrial	Mining	Agricultural	TCU	Streetlighting	Total Consumption
1980	0	25	264	0	0	0	0	289
1981	0	25	268	0	0	3	0	296
1982	0	25	343	24	0	99	0	492
1983	0	96	681	24	1	112	0	914
1984	0	122	718	147	1	116	0	1,103
1985	0	144	834	188	1	120	0	1,286
1986	0	162	958	188	1	120	0	1,428
1987	0	232	1,224	191	4	140	0	1,790
1988	0	317	2,333	202	9	158	0	3,019
1989	0	365	2,453	209	9	162	0	3,199
1990	0	455	2,457	221	10	165	0	3,308
1991	0	470	2,466	246	10	170	0	3,362
1992	0	501	2,477	247	10	173	0	3,408
1993	0	533	2,547	177	13	252	0	3,522
1994	0	538	2,564	183	13	260	0	3,558
1995	0	538	2,564	183	13	260	0	3,558
1996	0	538	2,595	183	13	260	0	3,589
1997	0	569	2,802	194	13	276	0	3,854
1998	0	570	2,767	198	13	268	0	3,815
1999	0	582	2,797	198	0	275	0	3,851
2000	0	565	2,734	204	0	273	0	3,776
2001	0	87	2,447	991	0	177	0	3,701
2002	0	152	3,167	1,176	0	266	0	4,761
2003	0	154	3,133	1,270	0	308	0	4,864
2006	0	162	3,298	1,337	0	324	0	5,120
2007	0	164	3,354	1,359	0	329	0	5,207
2008	0	166	3,392	1,375	0	333	0	5,266
2009	0	168	3,435	1,392	0	337	0	5,333
2010	0	170	3,471	1,407	0	341	0	5,389
2011	0	172	3,506	1,421	0	344	0	5,444
2012	0	174	3,548	1,438	0	349	0	5,508
2013	0	176	3,583	1,452	0	352	0	5,563
2014	0	178	3,625	1,469	0	356	0	5,629
2015	0	180	3,664	1,485	0	360	0	5,688
2016	0	181	3,691	1,496	0	363	0	5,730

**Annual Growth Rates (%)**

1980-1990	#DIV/0!	33.7	25.0	#DIV/0!	#DIV/0!	27.6
1990-2000	#DIV/0!	2.2	1.1	-0.8	5.2	1.3
2000-2003	#DIV/0!	-35.2	4.6	84.0	4.1	8.8
2003-2008	#DIV/0!	1.6	1.6	1.6	1.6	1.6
2008-2016	#DIV/0!	1.1	1.1	1.1	1.1	1.1
2003-2016	#DIV/0!	1.3	1.3	1.3	1.3	1.3

**Form 2.2 - SCE Planning Area**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Planning Area Economic and Demographic Assumptions**

Year	Population	Households	Persons per Household	Per Capita Income (2003\$)	Industrial Value Added (Millions 2003\$)
1980	8,412,107	2,990,771	2.813	23,644	44,313
1981	8,495,370	3,022,756	2.810	23,977	45,822
1982	8,631,588	3,043,156	2.836	23,626	46,420
1983	8,906,493	3,097,242	2.876	23,836	47,651
1984	9,173,113	3,173,341	2.891	25,184	52,157
1985	9,464,443	3,260,985	2.902	25,903	53,873
1986	9,823,553	3,374,689	2.911	26,396	53,773
1987	10,116,086	3,460,017	2.924	26,896	60,996
1988	10,431,689	3,558,722	2.931	27,254	65,220
1989	10,711,993	3,643,041	2.940	27,364	64,515
1990	10,871,384	3,684,484	2.951	27,610	63,780
1991	11,115,660	3,745,480	2.968	26,453	60,597
1992	11,318,991	3,782,773	2.992	26,367	57,205
1993	11,426,320	3,818,004	2.993	25,745	57,189
1994	11,518,482	3,846,043	2.995	25,743	57,357
1995	11,618,948	3,882,584	2.993	26,039	60,748
1996	11,714,299	3,915,140	2.992	26,569	64,068
1997	11,870,406	3,941,397	3.012	27,229	69,417
1998	12,014,711	3,974,644	3.023	28,873	75,496
1999	12,223,716	4,009,086	3.049	29,352	85,440
2000	12,470,547	4,041,620	3.086	30,176	92,379
2001	12,749,973	4,070,565	3.132	30,297	81,107
2002	13,002,664	4,113,488	3.161	30,131	72,775
2003	13,247,564	4,161,951	3.183	30,113	73,367
2004	13,424,505	4,208,981	3.189	30,714	75,343
2005	13,615,470	4,260,580	3.196	31,008	77,593
2006	13,806,387	4,311,915	3.202	31,191	79,068
2007	13,997,252	4,362,996	3.208	31,571	80,689
2008	14,188,058	4,413,803	3.214	32,036	82,694
2009	14,378,809	4,464,356	3.221	32,439	84,567
2010	14,573,009	4,515,778	3.227	32,804	86,425
2011	14,731,092	4,553,966	3.235	33,218	88,160
2012	14,889,166	4,591,964	3.242	33,633	90,018
2013	15,047,242	4,629,763	3.250	34,007	91,929
2014	15,205,305	4,667,364	3.258	34,366	93,780
2015	15,363,357	4,704,771	3.265	34,801	95,433
2016	15,521,399	4,741,981	3.273	35,207	96,952

**Annual Growth Rates (%)**

1990-2000	1.4	0.9	0.4	0.9	3.8
2000-2001	2.2	0.7	1.5	0.4	-12.2
2000-2003	2.0	1.0	1.0	-0.1	-7.4
2003-2008	1.4	1.2	0.2	1.2	2.4
2008-2016	1.1	0.9	0.2	1.2	2.0
2003-2016	1.2	1.0	0.2	1.2	2.2

**Form 2.3a - SCE Planning Area**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Electricity Rate Forecast (2003 cents/kwh)**

Year	GDP Implicit Price Deflator	Residential	Commercial	Industrial	Agriculture
1990	75.49	14.21	12.94	9.61	12.14
1991	78.13	14.90	13.55	9.60	12.29
1992	79.92	15.17	13.42	9.32	12.54
1993	81.77	14.81	12.39	8.53	12.70
1994	83.51	14.78	12.39	8.58	12.59
1995	85.22	15.12	12.13	8.43	12.88
1996	86.83	14.70	11.18	9.28	11.06
1997	88.28	14.45	10.74	9.12	11.38
1998	89.26	13.00	10.15	9.02	11.25
1999	90.54	12.81	9.57	8.90	11.09
2000	92.52	12.54	10.54	8.75	10.86
2001	94.74	14.03	13.51	12.80	13.95
2002	96.31	13.63	15.54	12.22	13.62
2003	98.07	13.73	13.72	12.43	13.80
2004	100.00	12.32	12.63	11.06	14.36
2005	101.51	11.94	12.41	11.82	14.54
2006	103.64	11.95	12.35	12.36	14.96
2007	105.58	11.89	12.05	12.39	15.27
2008	107.36	10.79	12.00	12.07	15.01
2009	109.26	10.42	11.76	11.84	14.82
2010	111.24	10.11	11.84	11.73	14.73
2011	113.25	9.62	11.79	11.62	14.57
2012	115.23	8.92	11.65	11.37	14.18
2013	117.23	8.63	11.72	11.24	14.07
2014	119.25	8.38	11.57	11.13	14.01
2015	121.31	8.13	11.44	10.99	13.93
2016	123.42	7.92	11.49	10.94	13.93

**Annual Growth Rates (%)**

1990-2000	2.1	-1.2	-2.0	-0.9	-1.1
2000-2001	2.4	11.9	28.2	46.2	28.4
2000-2003	2.0	3.1	9.2	12.4	8.3
2003-2008	1.8	-4.7	-2.6	-0.6	1.7
2008-2016	1.8	-3.8	-0.5	-1.2	-0.9
2003-2016	1.8	-4.1	-1.4	-1.0	0.1

**Form 2.3b - SCG Planning Area**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Natural Gas Price Forecast (2003 \$/MCF)**

Year	Core			Noncore				Electric Generation
	Residential	Commercial	Industrial	Commercial	Industrial	TEOR	Cogeneration	
1990	7.08	7.48	6.62	4.64	4.18	3.42	3.81	3.095
1991	7.87	8.26	7.55	4.02	3.94	3.13	3.33	3.531
1992	7.14	7.55	6.72	5.36	4.00	2.95	3.43	3.593
1993	7.57	8.05	7.34	11.01	4.02	3.29	3.48	3.384
1994	7.53	7.81	7.27	3.61	3.20	2.78	2.75	2.317
1995	7.86	7.76	6.88	2.78	2.51	2.13	2.31	1.915
1996	7.52	6.88	5.89	4.55	2.98	2.60	2.69	2.377
1997	7.87	7.18	6.00	4.49	3.68	3.31	3.23	2.926
1998	7.61	6.38	5.34	4.23	3.24	3.09	2.94	2.767
1999	6.78	5.70	4.63	4.20	3.11	3.03	2.82	2.752
2000	8.10	7.27	6.25	6.89	5.78	5.77	5.56	5.439
2001	7.44	8.21	6.81	11.45	8.74	8.77	8.59	8.585
2002	6.67	6.44	4.73	5.33	3.42	3.53	3.29	3.340
2003	8.60	7.56	6.48	9.15	5.41	5.40	5.29	5.475
2004	9.31	8.15	7.10	8.46	5.78	5.82	5.68	5.997
2005	9.40	7.87	6.28	6.06	6.06	6.03	5.88	5.88
2006	8.56	7.08	5.54	5.33	5.33	5.30	5.16	5.16
2007	8.81	7.33	5.79	5.59	5.59	5.56	5.44	5.44
2008	9.03	7.57	6.05	5.85	5.85	5.82	5.70	5.70
2009	8.78	7.33	5.81	5.61	5.61	5.58	5.46	5.46
2010	9.14	7.70	6.20	6.00	6.00	5.97	5.83	5.83
2011	9.00	7.58	6.10	5.90	5.90	5.87	5.73	5.73
2012	9.29	7.86	6.38	6.19	6.19	6.16	6.02	6.02
2013	9.93	8.52	7.05	6.86	6.86	6.83	6.68	6.68
2014	10.67	9.25	7.77	7.58	7.58	7.55	7.41	7.41
2015	10.45	9.05	7.59	7.40	7.40	7.37	7.23	7.23
2016	10.73	9.34	7.89	7.70	7.70	7.67	7.53	7.53

**Annual Growth Rates (%)**

1990-2000	1.4	-0.3		4.0	3.3	5.4	3.8
2000-2003	2.0	1.3	1.2	9.9	-2.1	-2.2	-1.6
2003-2008	1.0	0.0	-1.4	-8.6	1.6	1.5	1.5
2008-2016	2.2	2.7	3.4	3.5	3.5	3.5	3.5
2003-2016	1.7	1.6	1.5	-1.3	2.8	2.7	2.7

# CHAPTER 4

## SDG&E PLANNING AREA

The San Diego Gas & Electric planning area includes (1) SDG&E bundled retail customers, (2) customers served by various energy service providers (ESPs) using the SDG&E distribution system to deliver electricity to end-users, and (3) customers served by the City of Escondido.

This chapter is organized in a fashion similar to those for the other planning areas. First, forecasts of total and per capita consumption and peak loads for the planning area are presented. For perspective, CED 2006 values are compared to those in the CED 2003 forecast. The forecasted load factor, jointly determined by the consumption and peak load estimates, is also discussed. Then, sector consumption and peak load forecasts are presented and compared to the sector level CED 2003 forecast values. Prices used as inputs to the forecast are then presented; these were provided by the LSEs in the SDG&E planning area. Finally, the problems posed for the forecast by the potential inaccuracy of historic data are briefly discussed.

### Forecast Results

Table 4-1 presents a comparison of the planning area electricity consumption and peak demand forecasts for selected years.

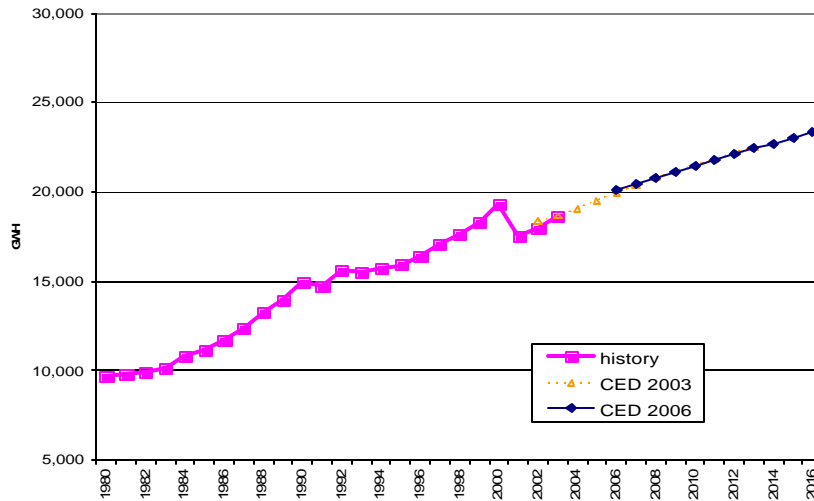
**Table 4-1: SDG&E Planning Area Forecast Comparison**

	Consumption (GWH)				Peak (MW)		
	CED 2003	CED 2006	%difference		CED 2003	CED 2006	%difference
1990	14,798	14,926	0.87%		2,780	2,961	6.51%
2000	18,791	19,295	2.68%		3,540	3,472	-1.91%
2003	18,663	18,689	0.14%		3,806	3,921	3.03%
2008	20,847	20,820	-0.13%		4,223	4,350	3.01%
2013	22,518	22,426	-0.41%		4,530	4,686	3.45%
2016	n/a	23,355			n/a	4,879	
Annual Average Growth Rates							
1990-2000	2.42%	2.60%			2.44%	1.60%	
2000-2003	-0.23%	-1.06%			2.45%	4.14%	
2003-2008	2.24%	2.18%			2.10%	2.10%	
2003-2013	1.90%	1.84%			1.76%	1.80%	
Historic values are shaded							

As shown in Figure 4-1, the two consumption forecasts are virtually the same although there are slight differences in forecasts at the individual sector level. These sector differences, which offset each other at the aggregate, planning area level, are discussed in their appropriate sector section below.



**Figure 4-1: SDG&E Planning Area Electricity Forecast**



In contrast, the CED 2006 SDG&E planning area peak demand forecast, shown in Figure 4-2, is slightly higher over the entire forecast period than its CED 2003 counterpart. The primary reason for the increase is a higher than previously forecasted starting point in 2003 due to the actual 2003 peak being greater than what was projected in the CED 2003 forecast. Smaller factors contributing to the increase is the use of updated industrial load shapes, as well as new residential load shapes, which more accurately account for air conditioning use during the summer air conditioning period. The forecasted mid and long term growth rates of peak demand are essentially unchanged from the CED 2003 forecast.

**Figure 4-2: SDG&E Planning Area Peak**

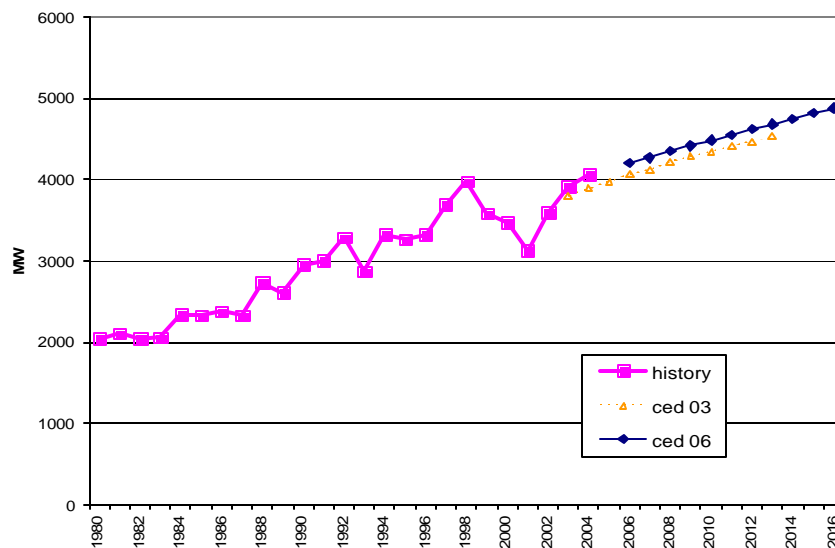
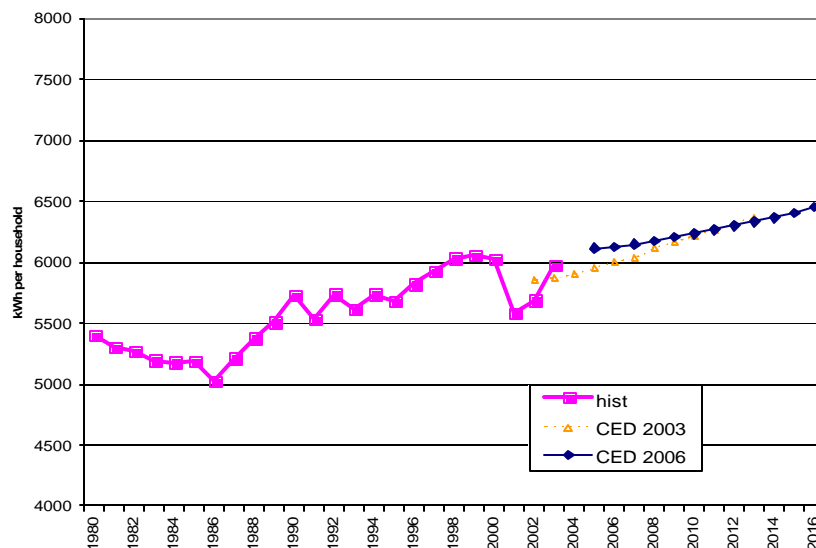


Figure 4-3 provides a comparison of forecasted per capita residential electricity consumption. Per capita consumption in the CED 2006 forecast is higher than projected in the CED 2003 forecast, due in large part to an upward revision in household income projections in the short term. The CED 2006 forecast, unlike its predecessor, uses county level income data to estimate household income at a planning area level. Statewide data used in CED 2003 masked the fact that recent recession did not lower household income in the SDG&E planning area. The forecast growth rate for per capita consumption in the San Diego planning area is slightly lower than the CED 2003 forecast due to lower long term economic and demographic projections.

**Figure 4-3: SDG&E Planning Area Per Capita Electricity Consumption**



Per capita peak demand, shown in Figure 4-4, is higher by a constant amount over the entire forecast period due to the greater than projected rebound of peak demand in 2003 and 2004. Adjusting for this change in the starting point, the two projections of per capita peak demand are similar throughout the forecast period and below pre-electricity crisis levels.

**Figure 4-4: SDG&E Planning Area per Capita Peak Demand**

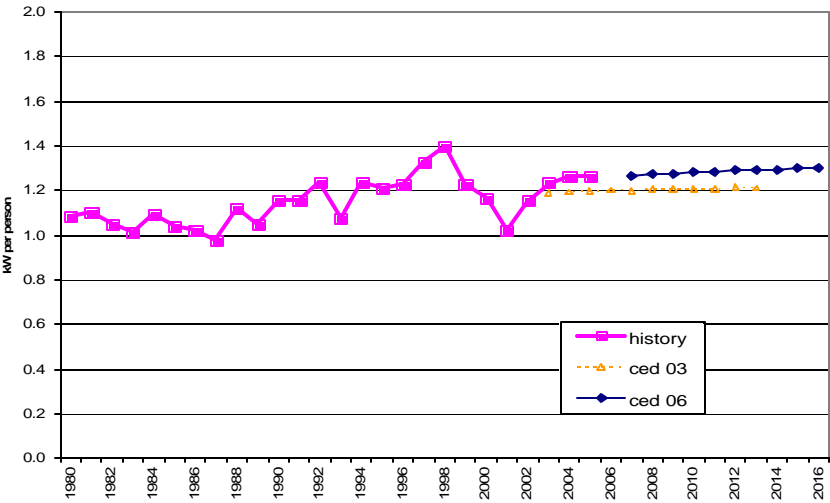
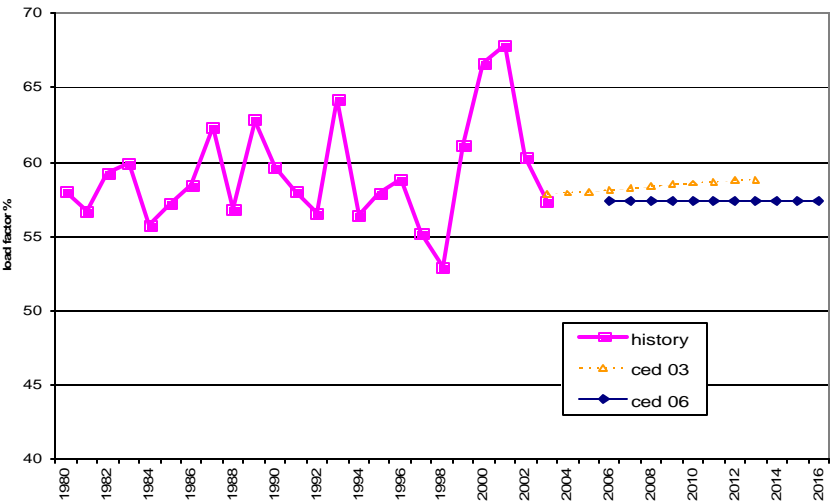


Figure 4-5 provides a comparison of the respective forecast load factors. High load factors observed since 1998 are a product of lower-than-average peak temperatures and reaction to the energy crisis. The projected load factor, based on higher, 1 in 2 peak temperatures, and a return to normal air conditioning use patterns, should be lower than these recent values. The forecasted load factor is relatively constant, reflecting the historic pattern.

**Figure 4-5: SDG&E Planning Area Peak Load Factor**



## Sector Level Results and Input Assumptions

### *Residential*

Figure 4-6 provides a comparison between the CED 2006 and CED 2003 SDG&E planning area residential forecasts. The CED 2006 forecast is slightly higher in 2006 due to actual 2003 household income levels being higher than values that were used in the CED 2003 forecast. In the long term, however, projected consumption growth is slower in the CED 2006 forecast due to lower projected population and household income growth rates.

**Figure 4-6: SDG&E Planning Area Residential Consumption**

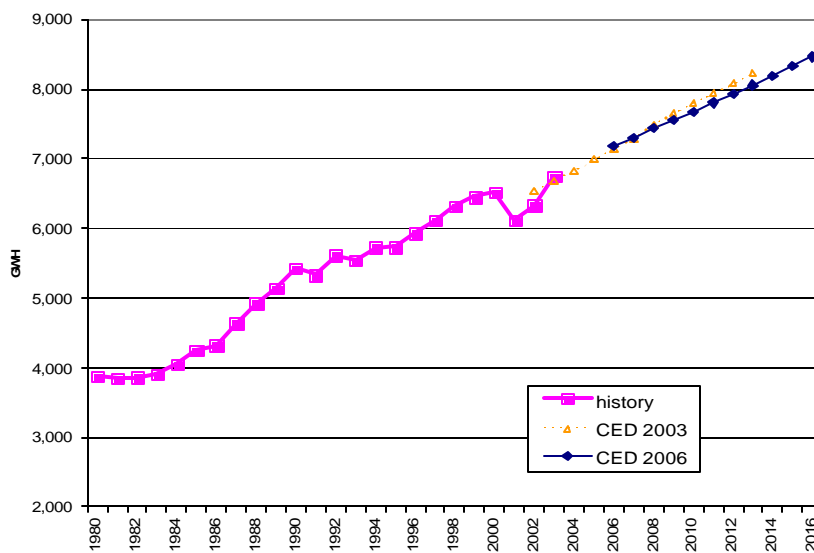
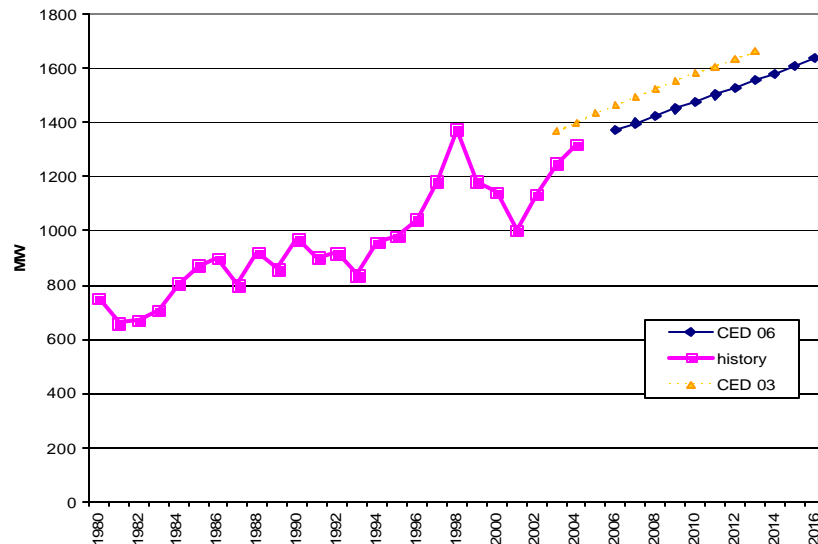


Figure 4-7 provides a comparison of the CED 2006 and CED 2003 residential peak demand forecasts. The CED 2006 residential peak forecast is lower than the CED 2003 forecast due to use of revised residential load shapes and the calibration of the forecast to actual SDG&E sector specific, load shapes rather than system level load profiles. Aside from the difference in starting values, the forecasted growth rates are very similar.

**Figure 4-7: SDG&E Planning Area Residential Peak**



Figures 4-8 and 4-9 provide comparisons of the residential drivers used in the CED 2006 forecast with those used in CED 2003. Figure 4-8 provides comparisons of total population, total households and persons per household projections. The CED 2006 forecast of total population is lower than the previous forecast after 2006 due to use of a new long term population forecast provided by DOF. Offsetting the lower population forecast is a decrease in the projection of persons per household. The forecasted growth in persons per household in the CED 2006 forecast is essentially half of the growth rate included in the CED 2003 forecast. The net effect of these two revisions is a slight reduction in the projected total number of households in the CED 2006 forecast.

**Figure 4-8: SDG&E Planning Area Residential Demographic Projections**

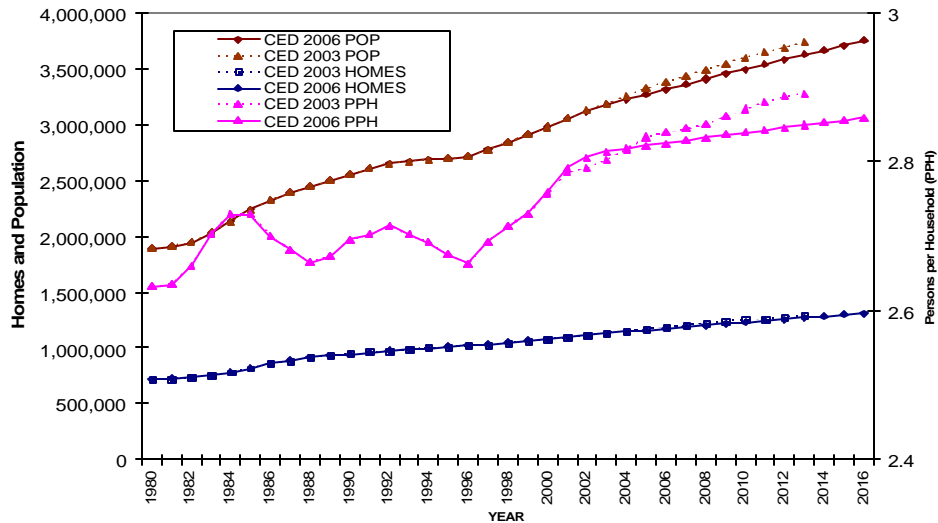


Figure 4-9 provides a comparison of household income between the two forecasts. The CED 2006 projection is higher in the short to mid term because of the above mentioned use of regional economic forecast data. These data show that, unlike the PG&E planning area, there was no reduction in household income in the San Diego region due to the recent economic downturn. In the longer term, CED 2006 forecasted household income growth is slower than that assumed for the CED 2003 forecast due to lower economic growth projections.

**Figure 4-9: SDG&E Planning Area Household Income Projections**

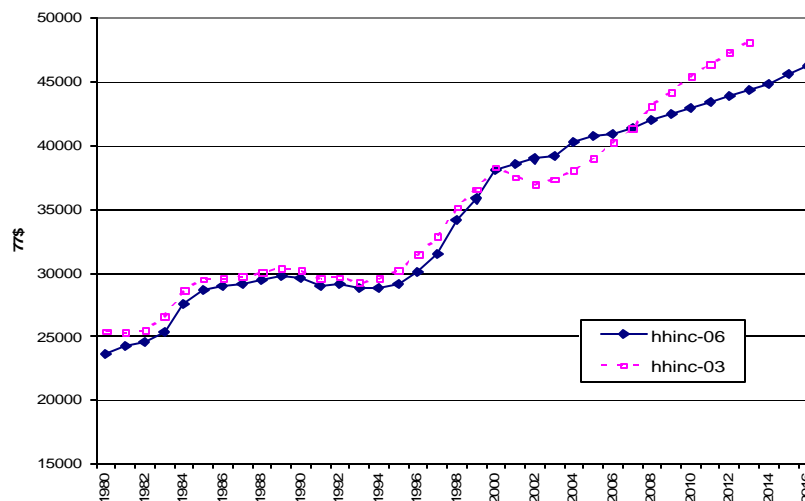
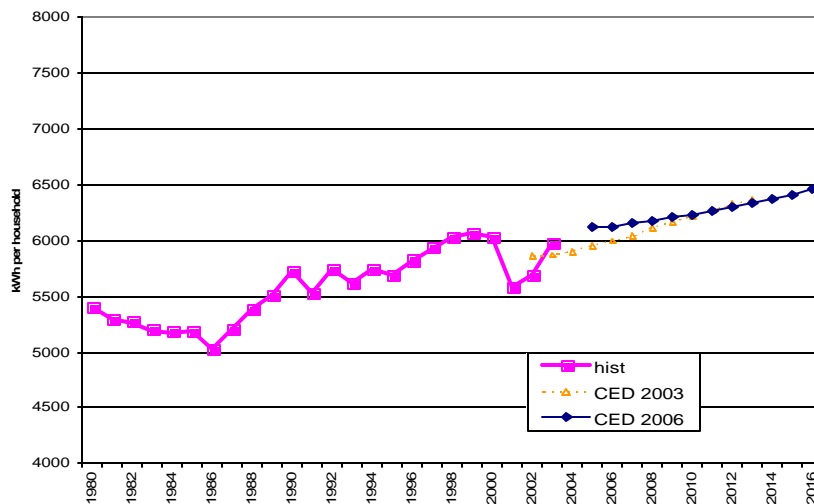


Figure 4-10 presents a comparison of forecasted use per household, as well as the 1980-2003 historical series. The CED 2006 forecast of use per household is higher than that projected in the CED 2003 forecast in the very near term as a result of the changes in economic and demographic estimates discussed above. The CED 2006 forecast increases at a lower rate than the CED 2003 forecast, in large part because lower growth rates have been assumed for residential economic and demographic drivers in the CED 2006 forecast.

**Figure 4-10: SDG&E Planning Area Use per Household**



### ***Commercial Building Sector***

Figures 4-11 and 4-12 provide a comparison of the commercial building sector forecasts. In Figure 4-11, the CED 2006 consumption forecast is slightly lower than its CED 2003 counterpart, due primarily to the estimated actual 2003 value being lower than that forecasted in CED 2003. One possible reason for the discrepancy in base year values for the commercial and other nonresidential sectors is discussed below in the section of this chapter on uncertainty. Once these starting point differences are accounted for, the forecasted rate of growth of commercial consumption is essentially unchanged.

**Figure 4-11: SDG&E Planning Area Commercial Consumption**

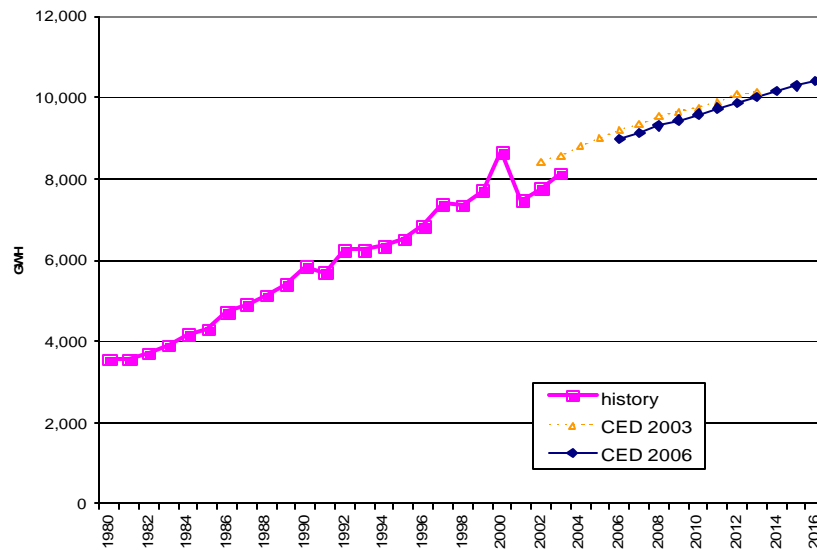
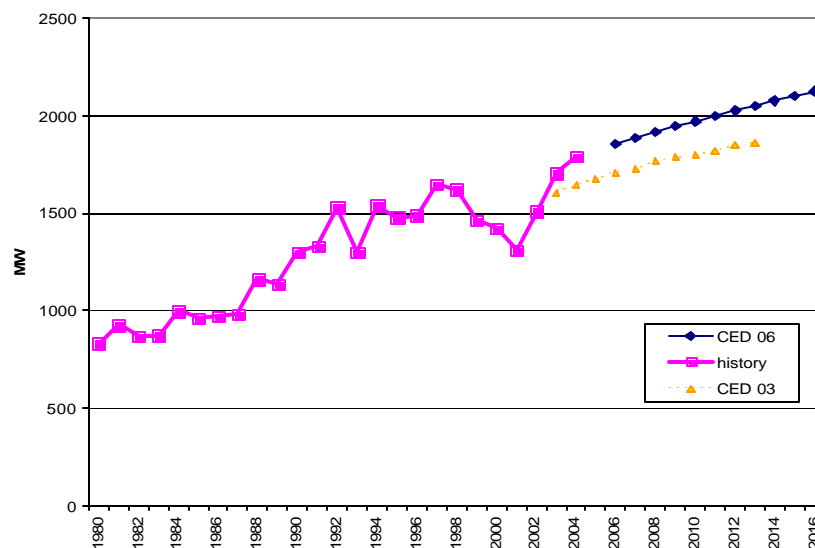


Figure 4-12 provides a comparison of the commercial building sector peak demand forecasts. The CED 2006 forecast is higher throughout the forecast period due to a higher starting value; this higher value was a result of using individual sector-specific load profiles, rather than the overall system load shape, to calibrate the forecast. These sector specific loads and revised residential and industrial load shapes indicate that a greater share of peak consumption is attributable to the commercial sector than previously thought. After the difference in initial starting value is accounted for, however, the growth rates in the two forecasts are very similar.

**Figure 4-12: SDG&E Planning Area Commercial Sector Peak**





In staff's commercial building sector forecasting model, floorspace by building type (e.g. retail, schools, offices, etc.) is the key driver of energy use for each specific building type. Figure 4-13 provides a comparison of total commercial floorspace projections. For the SDG&E planning area, the floorspace projections of the two forecasts are nearly identical.

**Figure 4-13: SDG&E Planning Area Commercial Floorspace**

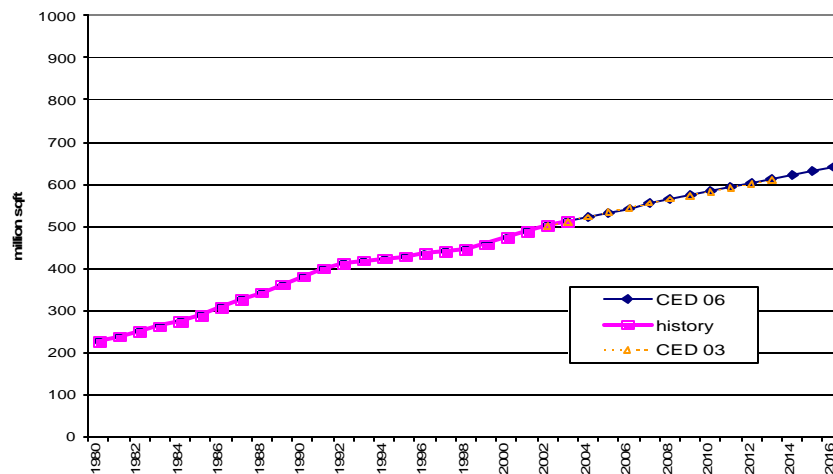
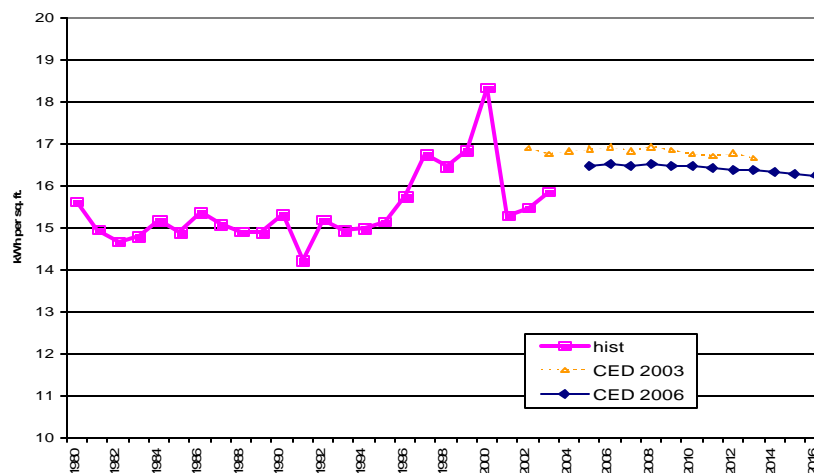


Figure 4-14 provides a comparison of kWh consumption per square foot of floorspace for the two forecasts. The use per square foot is lower over the entire period in the CED 2006 forecast, since actual 2003 consumption levels are down and the floorspace projections are nearly identical. The forecasted growth rate is slightly lower over the forecast period as a result of the impacts of the 1998-2005 iterations of the commercial building and appliance standards that were not fully addressed in the CED 2003 forecast.

**Figure 4-14: SDG&E Planning Area Commercial kWh per Sq. Ft.**



## Industrial Sector

Figure 4-15 provides a comparison of the industrial sector electricity consumption forecasts for the SDG&E planning area. The CED 2006 forecast is higher throughout the entire forecast period, primarily due to the greater than forecasted actual value in 2003. The forecasted growth rate is lower than that of the CED 2003 forecast, due in part to changes in the assumed mix of industries in the planning area. It is also a result, in part, of the recent increase in unclassified energy consumption reported by LSEs pursuant to QFER regulations and the method of allocating that consumption to the various nonresidential sectors. This is discussed in greater detail below.

**Figure 4-15: SDG&E Planning Area Industrial Consumption**

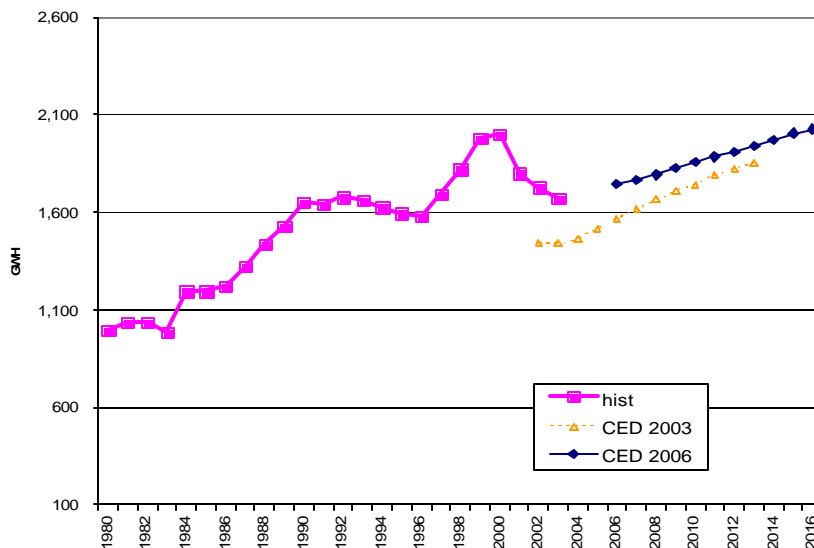


Figure 4-16 provides a comparison of the industrial sector peak forecasts. The CED 2006 peak is higher throughout the forecast period as a result of a higher starting value, the use of revised industrial load shapes and sector specific calibration of the forecast. As was the case for industrial sector consumption, the projected growth rate of peak demand is slightly lower than that projected in CED 2003.

**Figure 4-16: SDG&E Planning Area Industrial Sector Peak**

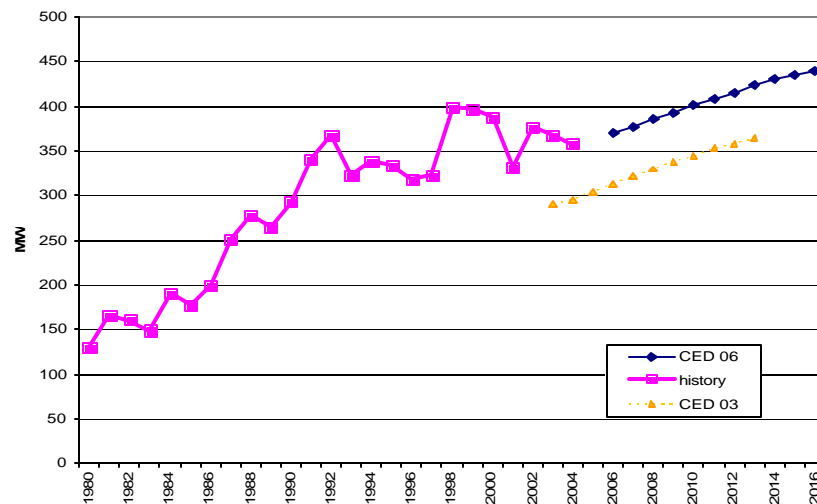
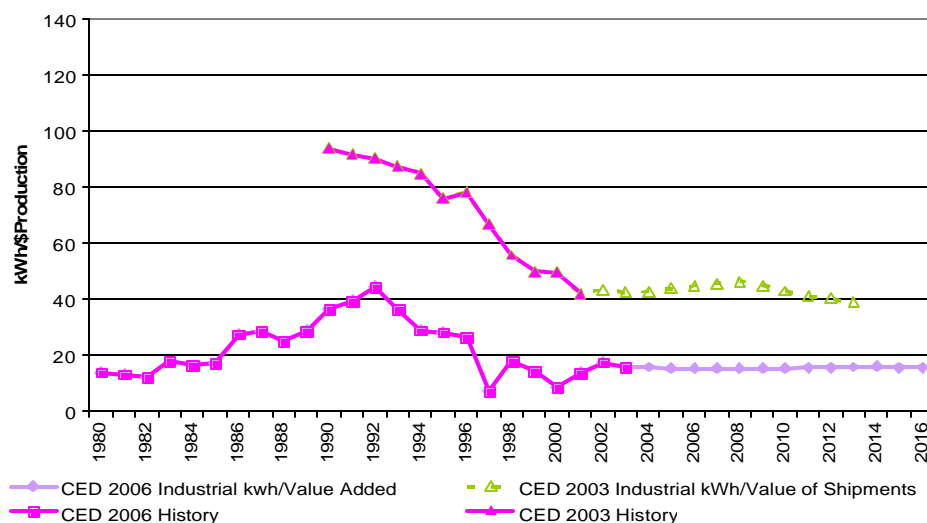


Figure 4-17 provides a comparison of use per dollar value of production between the CED 2006 and CED 2003 forecasts. As discussed in earlier chapters, staff now uses county level value added data, rather than statewide value of shipments figures in preparing the industrial sector forecast inputs. This enables staff to assume different patterns of economic activity in the separate utility planning areas for CED 2006. KWh per dollar of industrial value added in the CED 2006 industrial forecast is projected remain relatively constant, which is similar to the projections used in the CED 2003 forecast.

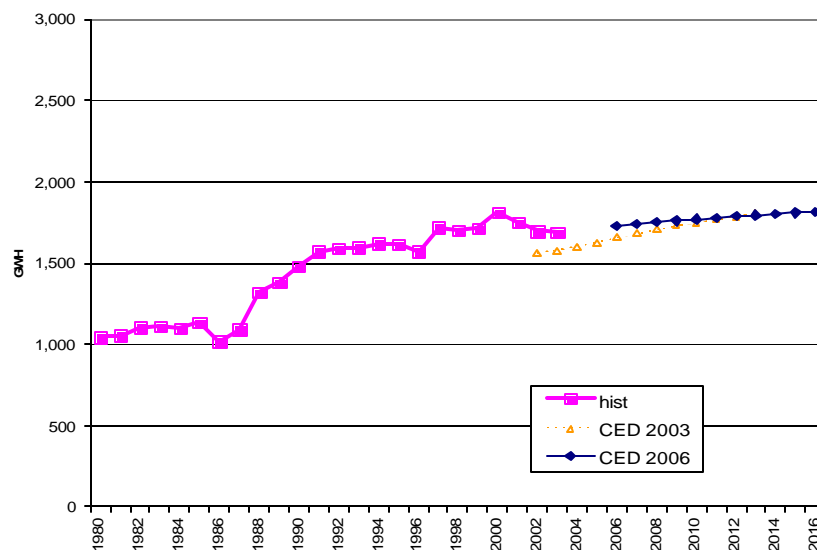
**Figure 4-17: SDG&E Planning Area Industrial Use per Production Unit**



## Other Sectors

Figures 4-18 and 4-19 provide comparisons of the remaining sector electricity consumption forecasts. Figure 4-18 provides a comparison of the transportation, communication and utilities (TCU) sector forecasts. The CED 2006 TCU forecast is slightly higher than the CED 2003 forecast due to a higher historical starting point. The CED 2006 forecasted growth rate is lower due to the assumption of a lower population growth rate. Because of lack of accurate historical data, the TCU sector was forecasted at the sector level, and thus driven by population, rather than at the sub-sector activity specific level, as was done for the previous forecast. Figure 4-19 provides comparisons of the agriculture and water pumping and mining and oil extraction sector forecasts. The CED 2006 agriculture and water pumping forecast is lower than the CED 2003 forecast; the CED 2006 mining and oil extraction forecast is higher. The latter due to a higher starting point and upward revision of the production drivers used in CED 2003 for the sector.

**Figure 4-18: SDG&E Planning Area Transportation, Communication & Utilities Sector Electricity Consumption**



**Figure 4-19: SDG&E Planning Area Agriculture & Water Pumping and Mining & Oil Extraction Electricity Consumption Forecasts**

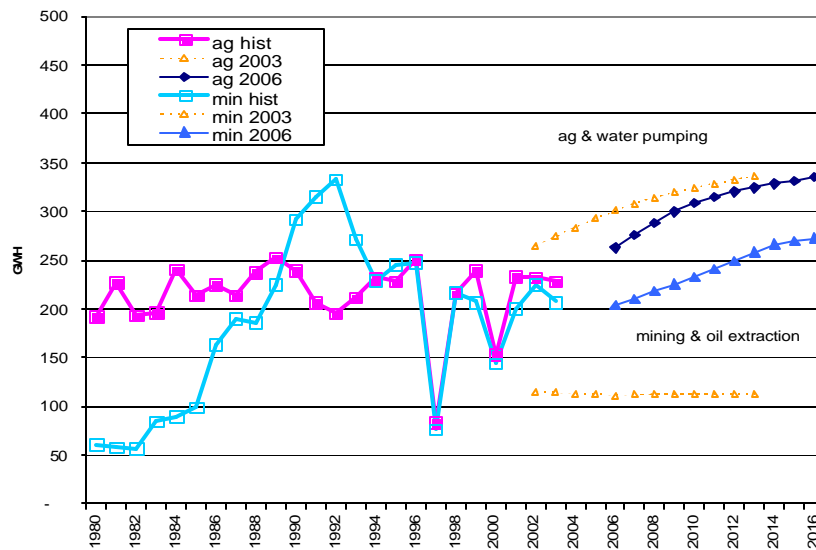
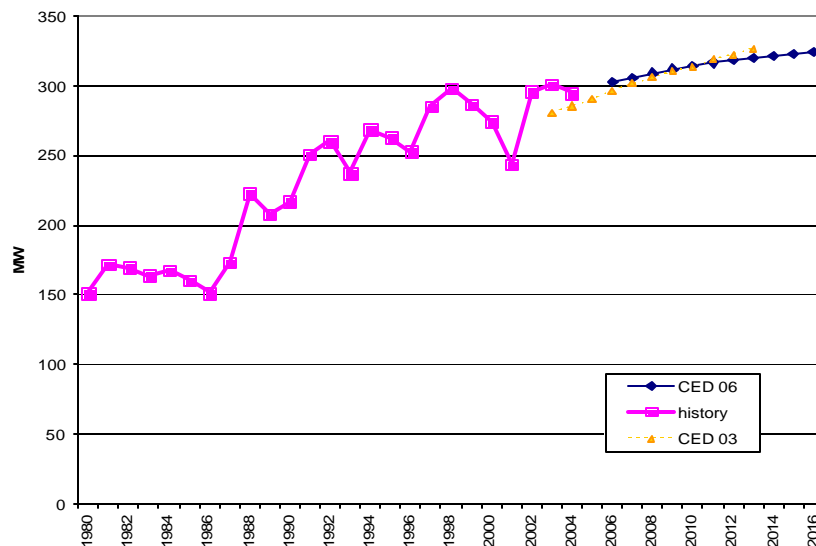


Figure 4-20 provides a comparison of the combined Other Sector peaks for the CED 2006 and CED 2003 forecasts. The CED 2006 forecast starts at a slightly higher level but grows at a lower rate over the forecast period, resulting in a slightly lower long-term forecast compared to CED 2003 values.

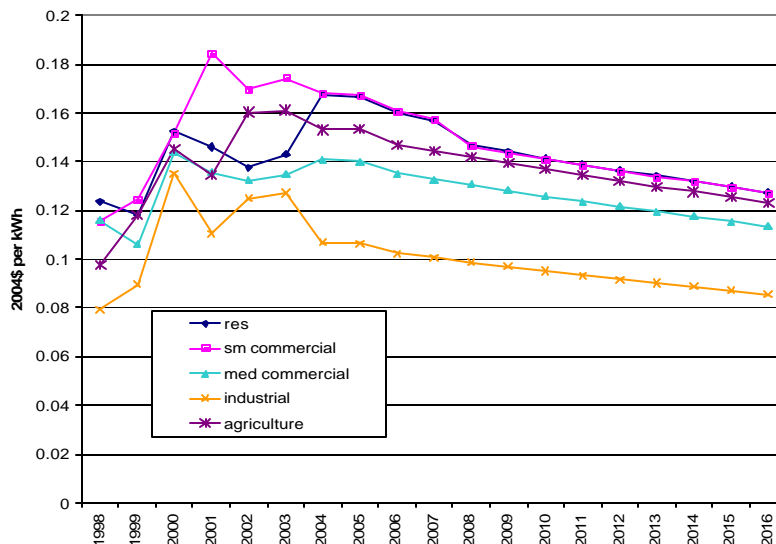
**Figure 4-20: SDG&E Planning Area Other Sector Peak**



## Electricity Prices

Figure 4-21 shows the sector prices used in the CED 2006 forecast for the SDG&E planning area. These electricity prices are inputs to the forecast and are based on information provided by each of the LSEs in the SDG&E planning area.<sup>1</sup> They represent a weighted average of SDG&E bundled service area and ESP price projections by customer class.

**Figure 4-21: SDG&E Planning Area Prices Used in Forecast**



## Uncertainty Introduced by Historical Data Inaccuracy

Figure 4-22 presents the historic values of unclassified electricity and national defense industry consumption for the SDG&E planning area, as reported to the Energy Commission pursuant to QFER reporting requirements. For the CED 2006 forecast, the staff allocated unclassified sales to national defense consumption so as to match recent historic levels. Staff believes that the drastic decrease in national defense industry consumption indicated by the reported data is not reasonable. Even if national defense consumption were no longer served by SDG&E through bundled service rates, some other LSE should be reporting sales classified as national defense to the CEC. This data classification issue noted to point out the need for more accurate reporting of electricity sales in order to produce more informed forecasts. In the absence of additional information, staff must resort to ad hoc methods of allocating unclassified consumption to individual sectors (for example, pro rata allocations based on classified sales). To the extent these methods do not reflect actual, sector specific consumption, the resulting forecasts will have greater uncertainty. Re-instituting a long-term planning process requires greater attention to fundamental data collection activities that serve as the starting point for forecasting efforts.

**Figure 4-22: SDG&E Planning Area Unclassified and Defense Industry Consumption**

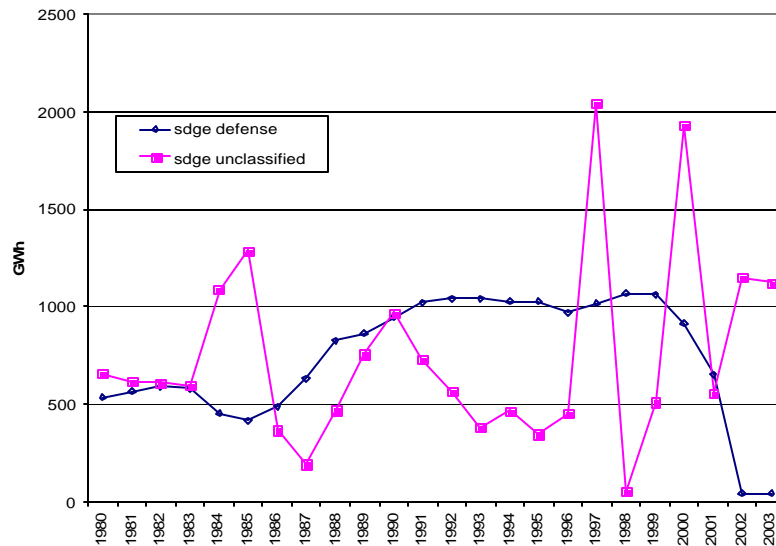
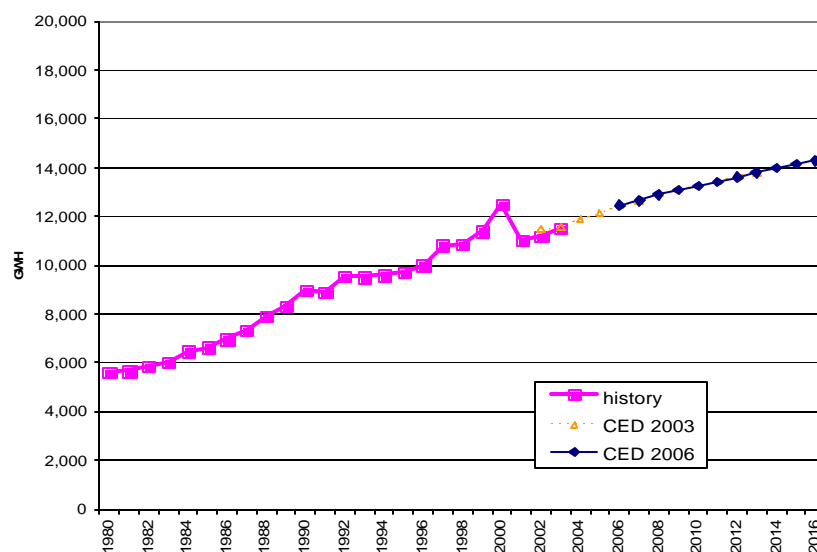


Figure 4-23 provides a comparison of the CED 2006 and CED 2003 forecasts of nonresidential consumption in aggregate. As is the case for other planning areas, the increase in sales reported as unclassified may not markedly affect estimates of nonresidential consumption in total. However, the design, implementation and assessment of efficiency and demand response programs requires an understanding of how nonresidential energy is used at more disaggregate levels.

**Figure 4-23: SDG&E Planning Area Nonresidential Electricity (Commercial, Industrial, TCU and Streetlighting)**



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<sup>1</sup> All LSEs >200MW peak demand were required to provide electricity price projections by customer sector pursuant to GENERAL INSTRUCTIONS: RETAIL ELECTRICITY PRICE FORECAST ELECTRICITY DATA REQUEST 2003-2016 adopted by Commissioner order, November 3, 2004.



**Form 1.1 - SDG&E**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Electricity Consumption by Sector (GWh)**

Year	Residential	Commercial	Industrial	Mining	Agricultural	TCU	Streetlighting	Total Consumption
1980	3,879	3,555	994	61	193	955	92	9,729
1981	3,848	3,577	1,037	58	227	968	89	9,804
1982	3,858	3,701	1,035	57	194	1,024	82	9,950
1983	3,909	3,900	987	85	197	1,038	77	10,192
1984	4,056	4,174	1,195	90	240	1,021	78	10,854
1985	4,249	4,291	1,199	99	214	1,058	77	11,187
1986	4,323	4,728	1,224	163	225	944	76	11,684
1987	4,638	4,917	1,322	190	214	1,019	77	12,377
1988	4,928	5,130	1,440	187	238	1,250	74	13,246
1989	5,144	5,406	1,527	225	253	1,311	73	13,939
1990	5,421	5,841	1,653	292	240	1,405	73	14,926
1991	5,333	5,698	1,640	316	207	1,495	76	14,764
1992	5,609	6,257	1,680	332	195	1,515	76	15,665
1993	5,549	6,253	1,665	272	212	1,521	77	15,549
1994	5,729	6,352	1,628	229	232	1,542	79	15,791
1995	5,734	6,503	1,595	246	228	1,537	81	15,923
1996	5,935	6,850	1,581	248	251	1,491	82	16,437
1997	6,123	7,384	1,694	77	84	1,637	83	17,082
1998	6,319	7,355	1,819	217	216	1,611	93	17,630
1999	6,453	7,716	1,979	207	239	1,624	93	18,312
2000	6,513	8,668	2,004	144	153	1,717	96	19,295
2001	6,116	7,468	1,799	200	233	1,656	98	17,571
2002	6,326	7,769	1,727	225	233	1,603	96	17,979
2003	6,745	8,142	1,675	207	228	1,587	105	18,689
2006	7,185	8,968	1,767	205	263	1,621	108	20,116
2007	7,305	9,117	1,793	211	276	1,631	109	20,441
2008	7,433	9,303	1,826	218	289	1,642	110	20,820
2009	7,559	9,447	1,857	225	300	1,652	110	21,150
2010	7,678	9,593	1,886	233	308	1,660	111	21,470
2011	7,803	9,737	1,912	241	315	1,668	112	21,787
2012	7,929	9,879	1,943	249	320	1,675	113	22,107
2013	8,055	10,020	1,975	258	324	1,682	113	22,426
2014	8,182	10,157	2,006	266	328	1,688	114	22,742
2015	8,324	10,292	2,026	269	332	1,695	115	23,052
2016	8,466	10,423	2,042	273	335	1,701	115	23,355

**Annual Growth Rates (%)**

1980-1990	3.4	5.1	5.2	16.9	2.2	3.9	-2.2	4.4
1990-2000	1.9	4.0	1.9	-6.8	-4.4	2.0	2.7	2.6
2000-2003	1.2	-2.1	-5.8	12.9	14.2	-2.6	3.2	-1.1
2003-2008	2.0	2.7	1.7	1.0	4.8	0.7	0.8	2.2
2008-2016	1.6	1.4	1.4	2.9	1.9	0.4	0.6	1.4
2003-2016	1.8	1.9	1.5	2.1	3.0	0.5	0.7	1.7

**Form 1.1b - SDG&E**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Electricity Sales by Sector (GWh)**

Year	Residential	Commercial	Industrial	Mining	Agricultural	TCU	Streetlighting	Total Consumption
1980	3,879	3,555	994	61	193	955	92	9,729
1981	3,848	3,577	1,037	58	227	968	89	9,804
1982	3,858	3,696	1,029	57	194	1,024	82	9,939
1983	3,909	3,871	969	85	194	1,038	77	10,143
1984	4,056	4,121	1,135	90	238	993	78	10,711
1985	4,249	4,197	1,118	99	212	986	77	10,938
1986	4,323	4,610	1,114	163	225	865	76	11,377
1987	4,638	4,756	1,130	190	214	925	77	11,930
1988	4,927	4,937	1,204	187	238	1,154	74	12,722
1989	5,144	5,238	1,298	225	253	1,206	73	13,437
1990	5,421	5,686	1,450	292	239	1,298	73	14,460
1991	5,333	5,552	1,427	316	206	1,384	76	14,294
1992	5,609	6,123	1,471	332	195	1,412	76	15,218
1993	5,549	6,115	1,472	272	211	1,438	77	15,134
1994	5,729	6,208	1,449	229	232	1,455	79	15,381
1995	5,734	6,360	1,420	246	228	1,456	81	15,524
1996	5,935	6,708	1,407	248	251	1,416	82	16,046
1997	6,123	7,242	1,530	77	84	1,560	83	16,698
1998	6,319	7,213	1,659	217	216	1,533	93	17,249
1999	6,453	7,577	1,815	207	239	1,547	93	17,931
2000	6,513	8,531	1,854	144	153	1,637	96	18,928
2001	6,116	7,428	1,685	200	233	1,603	98	17,363
2002	6,326	7,726	1,599	225	233	1,563	96	17,769
2003	6,745	8,015	1,523	207	228	1,574	105	18,398
2006	7,185	8,802	1,568	205	263	1,604	108	19,734
2007	7,305	8,940	1,580	211	276	1,614	109	20,033
2008	7,433	9,122	1,609	218	289	1,624	110	20,405
2009	7,559	9,264	1,637	225	300	1,634	110	20,728
2010	7,678	9,407	1,663	233	308	1,642	111	21,042
2011	7,803	9,549	1,686	241	315	1,649	112	21,353
2012	7,929	9,688	1,713	249	320	1,656	113	21,668
2013	8,055	9,826	1,742	258	324	1,662	113	21,981
2014	8,182	9,961	1,770	266	328	1,669	114	22,290
2015	8,324	10,093	1,788	269	332	1,675	115	22,596
2016	8,466	10,222	1,801	273	335	1,680	115	22,893

**Annual Growth Rates (%)**

1980-1990	3.4	4.8	3.8	16.9	2.2	3.1	-2.2	4.0
1990-2000	1.9	4.1	2.5	-6.8	-4.4	2.3	2.7	2.7
2000-2003	1.2	-2.1	-6.3	12.9	14.2	-1.3	3.2	-0.9
2003-2008	2.0	2.6	1.1	1.0	4.8	0.6	0.8	2.1
2008-2016	1.6	1.4	1.4	2.9	1.9	0.4	0.6	1.4
2003-2016	1.8	1.9	1.3	2.1	3.0	0.5	0.7	1.7

**Form 1.2 - SDG&E**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Net Energy for Load (GWh)**

Year	Total Consumption	Net Losses	Gross Generation	Private Supply	Net Energy for Load
1980	9,729	690	10,419	0	10,419
1981	9,804	695	10,499	0	10,499
1982	9,950	705	10,655	11	10,644
1983	10,192	719	10,912	50	10,862
1984	10,854	759	11,614	144	11,470
1985	11,187	775	11,963	250	11,713
1986	11,684	807	12,490	307	12,183
1987	12,377	846	13,223	447	12,776
1988	13,246	902	14,148	524	13,624
1989	13,939	953	14,891	502	14,389
1990	14,926	1,025	15,952	466	15,485
1991	14,764	1,013	15,778	470	15,308
1992	15,665	1,079	16,744	446	16,297
1993	15,549	1,073	16,622	415	16,207
1994	15,791	1,091	16,881	410	16,472
1995	15,923	1,101	17,024	400	16,624
1996	16,437	1,138	17,574	391	17,184
1997	17,082	1,184	18,266	384	17,882
1998	17,630	1,223	18,853	381	18,472
1999	18,312	1,271	19,583	381	19,202
2000	19,295	1,342	20,637	367	20,270
2001	17,571	1,231	18,802	208	18,595
2002	17,979	1,260	19,239	210	19,028
2003	18,689	1,304	19,994	292	19,702
2006	20,116	1,399	21,515	382	21,133
2007	20,441	1,420	21,861	407	21,454
2008	20,820	1,447	22,267	415	21,852
2009	21,150	1,470	22,619	422	22,198
2010	21,470	1,492	22,962	428	22,534
2011	21,787	1,514	23,301	434	22,867
2012	22,107	1,536	23,644	440	23,204
2013	22,426	1,558	23,985	446	23,539
2014	22,742	1,580	24,322	452	23,870
2015	23,052	1,602	24,654	457	24,198
2016	23,355	1,623	24,978	462	24,516

**Annual Growth Rates (%)**

1980-1990	4.4	4.0	4.4		4.0
1990-2000	2.6	2.7	2.6	-2.4	2.7
2000-2003	-1.1	-0.9	-1.0	-7.3	-0.9
2003-2008	2.2	2.1	2.2	7.3	2.1
2008-2016	1.5	1.5	1.5	1.4	1.5
2003-2016	1.8	1.8	1.8	4.3	1.8

**Form 1.3 - SDG&E Planning Area**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Coincident Peak Demand by Sector (MW)**

Year	Residential		Commercial		Industrial			Total Industrial	Agr.	TCU & Street-lighting	Total	
	Base Load	Weather Sensitive	Base Load	Weather Sensitive	Process	Assembly	Mining					
1990	758	213	871	428	10	221	62	293	26	191	2,780	971
1991	758	144	953	381	11	253	79	342	24	227	2,828	902
1992	791	127	988	542	10	272	85	367	25	236	3,076	918
1993	719	119	909	390	14	246	64	323	21	216	2,697	838
1994	795	164	1,014	526	15	264	59	338	26	243	3,107	959
1995	789	191	1,020	458	16	257	62	335	25	238	3,055	979
1996	873	170	1,056	433	17	245	57	320	27	226	3,105	1,043
1997	949	234	1,093	554	6	298	18	323	27	258	3,438	1,183
1998	1,029	345	1,148	474	19	325	55	400	30	268	3,695	1,374
1999	1,021	163	1,126	341	20	325	53	397	27	260	3,335	1,185
2000	1,013	130	1,064	360	15	338	35	388	27	247	3,230	1,143
2001	837	167	954	355	16	269	46	332	22	221	2,890	1,005
2002	999	136	1,136	375	19	296	61	376	28	268	3,318	1,134
2003	980	270	1,165	543	20	290	58	367	27	275	3,627	1,250
2004	968	354	1,178	616	19	285	54	358	28	267	3,769	1,322
												0
2006	1,001	372	1,226	631	20	296	55	371	31	272	3,904	1,373
2007	1,018	380	1,247	637	20	300	57	378	32	274	3,966	1,398
2008	1,036	389	1,273	646	21	306	59	386	34	275	4,039	1,425
2009	1,053	399	1,293	652	21	311	61	393	35	277	4,102	1,452
2010	1,070	407	1,314	659	22	316	63	401	36	278	4,165	1,477
2011	1,087	416	1,335	665	22	320	65	407	37	280	4,226	1,503
2012	1,104	425	1,355	671	23	325	67	415	38	281	4,288	1,529
2013	1,122	434	1,375	677	23	330	70	423	38	282	4,350	1,555
2014	1,139	442	1,394	683	24	335	72	431	38	283	4,411	1,582
2015	1,159	452	1,413	689	25	338	73	436	39	284	4,471	1,610
2016	1,178	461	1,432	694	25	341	74	440	39	285	4,529	1,639

**Annual Growth Rates (%)**

1980-1990	3.7	-0.6	5.9	2.3	-3.4	7.6	19.0	8.3	1.0	4.1	4.0
1990-2000	2.9	-4.9	2.0	-1.7	4.0	4.4	-5.7	2.8	0.4	2.6	1.5
2000-2001	-17.4	29.2	-10.3	-1.3	9.9	-20.5	32.9	-14.5	-16.5	-10.6	-10.5
2000-2003	-1.1	27.7	3.0	14.7	9.7	-5.0	18.7	-1.8	-0.4	3.6	3.9
2003-2008	1.1	7.6	1.8	3.5	1.3	1.1	0.3	1.0	4.9	0.0	2.2
2008-2016	1.6	2.1	1.5	0.9	2.2	1.4	2.9	1.7	1.9	0.4	1.4
2003-2016	1.4	4.2	1.6	1.9	1.8	1.3	1.9	1.4	3.0	0.3	1.7

**Form 1.4 - SDG&E Planning Area**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Peak Demand (MW)**

Year	Total End Use Load	Net Losses	Gross Generation	Private Supply	Net Peak Demand	Load Factor (%)
1980	1,870	180	2,050	0	2,050	58.0
1981	1,928	185	2,113	0	2,113	56.7
1982	1,871	179	2,050	2	2,049	59.3
1983	1,896	181	2,077	8	2,069	59.9
1984	2,166	206	2,372	24	2,348	55.8
1985	2,172	204	2,376	42	2,335	57.3
1986	2,222	208	2,430	52	2,379	58.5
1987	2,209	205	2,414	75	2,339	62.4
1988	2,587	240	2,827	88	2,739	56.8
1989	2,470	229	2,699	84	2,615	62.8
1990	2,780	259	3,039	78	2,961	59.7
1991	2,828	264	3,092	79	3,013	58.0
1992	3,076	288	3,364	75	3,289	56.6
1993	2,697	252	2,949	70	2,880	64.2
1994	3,107	292	3,399	69	3,330	56.5
1995	3,055	287	3,342	67	3,275	58.0
1996	3,105	292	3,397	66	3,331	58.9
1997	3,438	324	3,762	64	3,697	55.2
1998	3,695	349	4,044	64	3,980	53.0
1999	3,335	314	3,649	64	3,585	61.1
2000	3,230	304	3,534	62	3,472	66.6
2001	2,890	274	3,164	35	3,129	67.8
2002	3,318	315	3,633	35	3,598	60.4
2003	3,627	343	3,970	49	3,921	57.4
2004	3,769	356	4,125	56	4,070	57.5
2006	3,904	369	4,272	64	4,208	57.3
2007	3,966	374	4,340	68	4,271	57.3
2008	4,039	381	4,420	70	4,350	57.3
2009	4,102	387	4,489	71	4,419	57.3
2010	4,165	393	4,557	72	4,486	57.3
2011	4,226	399	4,624	73	4,552	57.4
2012	4,288	405	4,693	74	4,619	57.3
2013	4,350	410	4,761	75	4,686	57.3
2014	4,411	416	4,827	76	4,752	57.3
2015	4,471	422	4,893	77	4,816	57.4
2016	4,529	427	4,957	78	4,879	57.4

**Annual Growth Rates (%)**

1990-2000	1.5	1.6	1.5	-2.4	1.6
2000-2001	-10.5	-9.9	-10.5	-43.3	-9.9
2000-2003	3.9	4.1	4.0	-7.3	4.1
2003-2008	2.2	2.1	2.2	7.3	2.1
2008-2016	1.4	1.4	1.4	1.3	1.4
2003-2016	1.7	1.7	1.7	3.6	1.7

**Form 1.5 - SDG&E**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Noncoincident Peak Demand Temperature Scenarios**

Year	1-in-2 Temperatures	1-in-5 Temperatures	1-in-10 Temperatures	1-in-20 Temperatures	1-in-5 Multiplier	1-in-10 Multiplier	1-in-20 Multiplier
2006	4,208	4,600	4,752	4,808	1.093	1.129	1.143
2007	4,271	4,669	4,824	4,880	1.093	1.129	1.143
2008	4,350	4,756	4,913	4,971	1.093	1.129	1.143
2009	4,419	4,831	4,990	5,049	1.093	1.129	1.143
2010	4,486	4,904	5,066	5,125	1.093	1.129	1.143
2011	4,552	4,976	5,140	5,200	1.093	1.129	1.143
2012	4,619	5,049	5,216	5,277	1.093	1.129	1.143
2013	4,686	5,123	5,292	5,354	1.093	1.129	1.143
2014	4,752	5,194	5,366	5,429	1.093	1.129	1.143
2015	4,816	5,265	5,439	5,503	1.093	1.129	1.143
2016	4,879	5,334	5,510	5,575	1.093	1.129	1.143

**Form 1.7a - SDG&E**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Private Supply by Sector (GWh)**

Year	Residential	Commercial	Industrial	Mining	Agricultural	TCU	Streetlighting	Total Consumption
1980	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0
1982	0	5	6	0	0	0	0	11
1983	0	29	18	0	3	0	0	50
1984	0	53	60	0	3	28	0	144
1985	0	94	81	0	2	72	0	250
1986	0	118	110	0	0	79	0	307
1987	0	161	192	0	0	93	0	447
1988	0	193	235	0	0	95	0	524
1989	0	167	229	0	0	105	0	502
1990	0	155	203	0	1	107	0	466
1991	0	146	213	0	1	111	0	470
1992	0	134	209	0	1	103	0	446
1993	0	139	193	0	0	83	0	415
1994	0	144	178	0	0	87	0	410
1995	0	143	175	0	0	81	0	400
1996	0	142	174	0	0	75	0	391
1997	0	142	165	0	0	77	0	384
1998	0	142	161	0	0	78	0	381
1999	0	139	165	0	0	78	0	381
2000	0	137	150	0	0	79	0	367
2001	0	41	114	0	0	53	0	208
2002	0	42	128	0	0	40	0	210
2003	0	127	152	0	0	13	0	292
2006	0	166	199	0	0	17	0	382
2007	0	177	213	0	0	18	0	407
2008	0	180	217	0	0	18	0	415
2009	0	183	220	0	0	18	0	422
2010	0	186	223	0	0	19	0	428
2011	0	188	226	0	0		0	415
2012	0	191	230	0	0		0	421
2013	0	194	233	0	0		0	426
2014	0	196	236	0	0		0	432
2015	0	198	239	0	0		0	437
2016	0	201	241	0	0		0	442

**Annual Growth Rates (%)**

1980-1990				
1990-2000	-1.2	-3.0	-3.0	-2.4
2000-2003	-2.6	0.5	-45.7	-7.3
2003-2008	7.3	7.3	7.3	7.3
2008-2016	1.3	1.3	-100.0	0.8
2003-2016	3.6	3.6	-100.0	3.2

**Form 2.2 - SDG&E Planning Area**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Planning Area Economic and Demographic Assumptions**

Year	Population	Households	Persons per Household	Per Capita Income (2003\$)	Industrial Value Added (Millions 2003\$)
1980	1,890,510	718,312	2.632	22,314	4,409
1981	1,913,432	725,903	2.636	22,877	4,434
1982	1,948,429	732,411	2.660	22,911	4,777
1983	2,033,615	752,124	2.704	23,330	4,818
1984	2,136,850	783,080	2.729	25,027	5,480
1985	2,235,850	819,194	2.729	26,014	5,867
1986	2,323,871	860,569	2.700	26,626	5,961
1987	2,388,259	890,272	2.683	26,921	6,685
1988	2,442,254	916,425	2.665	27,417	7,494
1989	2,495,065	933,395	2.673	27,626	7,826
1990	2,549,875	946,084	2.695	27,224	8,108
1991	2,604,754	964,042	2.702	26,559	8,041
1992	2,653,615	977,591	2.714	26,668	7,482
1993	2,670,770	988,476	2.702	26,423	7,519
1994	2,688,860	998,758	2.692	26,524	7,952
1995	2,699,012	1,008,967	2.675	26,988	8,757
1996	2,714,332	1,019,262	2.663	28,050	9,430
1997	2,780,839	1,032,431	2.693	28,984	10,813
1998	2,842,512	1,047,694	2.713	31,182	12,270
1999	2,908,551	1,064,929	2.731	32,541	14,900
2000	2,982,338	1,080,400	2.760	34,207	17,082
2001	3,058,574	1,095,146	2.793	34,294	14,646
2002	3,120,111	1,112,187	2.805	34,458	12,981
2003	3,175,986	1,128,441	2.814	34,584	13,201
2004	3,222,142	1,143,392	2.818	35,492	13,665
2005	3,268,421	1,158,341	2.822	35,782	14,130
2006	3,314,828	1,173,293	2.825	35,926	14,486
2007	3,361,362	1,188,247	2.829	36,300	14,886
2008	3,408,025	1,203,200	2.832	36,746	15,362
2009	3,454,812	1,218,153	2.836	37,128	15,804
2010	3,498,228	1,231,987	2.840	37,488	16,232
2011	3,540,489	1,245,417	2.843	37,917	16,639
2012	3,582,784	1,258,823	2.846	38,331	17,086
2013	3,625,109	1,272,206	2.849	38,705	17,544
2014	3,667,467	1,285,564	2.853	39,073	17,988
2015	3,709,858	1,298,905	2.856	39,603	18,362
2016	3,752,280	1,312,220	2.859	40,099	18,706

**Annual Growth Rates (%)**

1990-2000	1.6	1.3	0.2	2.3	7.7
2000-2001	2.6	1.4	1.2	0.3	-14.3
2000-2003	2.1	1.5	0.6	0.4	-8.2
2003-2008	1.4	1.3	0.1	1.2	3.1
2008-2016	1.2	1.1	0.1	1.1	2.5
2003-2016	1.3	1.2	0.1	1.1	2.7



**Form 2.3a - SDG&E Planning Area**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Electricity Rate Forecast (2003 cents/kwh)**

Year	GDP Implicit Price Deflator	Residential	Small Commercial	Medium Commercial	Industrial	Agriculture
1990	75.49	13.83	11.58	11.58	9.24	9.91
1991	78.13	13.46	11.43	11.43	9.08	9.75
1992	79.92	13.41	11.24	11.24	8.91	9.85
1993	81.77	13.56	11.64	11.64	8.82	10.46
1994	83.51	12.80	11.30	11.30	8.47	10.56
1995	85.22	12.48	11.10	11.10	8.25	10.15
1996	86.83	13.96	11.07	11.07	8.20	10.06
1997	88.28	13.73	11.71	11.71	8.07	9.89
1998	89.26	12.35	11.58	11.57	7.94	9.73
1999	90.54	11.82	12.44	10.61	8.97	11.80
2000	92.52	15.22	15.19	14.38	13.49	14.50
2001	94.74	14.60	18.45	13.56	11.04	13.46
2002	96.31	13.77	16.98	13.24	12.49	16.03
2003	98.07	14.28	17.43	13.45	12.71	16.10
2004	100.00	16.74	16.79	14.07	10.67	15.31
2005	101.51	16.67	16.72	13.98	10.65	15.33
2006	103.64	16.02	16.06	13.52	10.24	14.70
2007	105.58	15.71	15.75	13.27	10.05	14.43
2008	107.36	14.65	14.63	13.05	9.86	14.18
2009	109.26	14.40	14.38	12.82	9.68	13.93
2010	111.24	14.14	14.12	12.59	9.51	13.68
2011	113.25	13.89	13.87	12.36	9.34	13.43
2012	115.23	13.65	13.63	12.15	9.18	13.20
2013	117.23	13.41	13.39	11.94	9.02	12.98
2014	119.25	13.18	13.17	11.73	8.86	12.75
2015	121.31	12.96	12.94	11.53	8.71	12.54
2016	123.42	12.74	12.72	11.33	8.56	12.32

**Annual Growth Rates (%)**

1990-2000

2000-2001	2.4	-4.1	21.5	-5.7	-18.2	-7.2
2000-2003	2.0	-2.1	4.7	-2.2	-2.0	3.5
2003-2008	1.8	0.5	-3.4	-0.6	-5.0	-2.5
2008-2016	1.8	-1.7	-1.7	-1.7	-1.7	-1.7
2003-2016	1.8	-0.9	-2.4	-1.3	-3.0	-2.0

**Form 2.3b - SDG&E Planning Area**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Natural Gas Price Forecast (2003 \$/MCF)**

	Core			Noncore				
	Residential	Commercial	Industrial	Commercial	Industrial	TEOR	Cogeneration	Electric Generation
1990	7.11	7.34	7.07	4.84	4.89	0.00	4.21	4.301
1991	6.92	6.89	6.24	4.25	4.36	0.00	3.74	3.976
1992	6.91	7.19	6.55	4.32	4.33	0.00	3.67	3.703
1993	7.25	7.80	6.78	2.81	2.66	0.00	2.61	2.762
1994	7.32	7.28	6.05	3.89	4.18	0.00	3.08	2.299
1995	7.13	6.99	5.88	3.01	3.03	0.00	2.14	1.689
1996	7.33	7.13	6.35	3.53	3.15	0.00	2.98	2.431
1997	7.74	7.38	6.62	3.98	3.73	0.00	3.30	3.088
1998	8.04	7.48	6.65	4.36	4.11	0.00	3.11	2.883
1999	8.28	7.57	6.67	4.75	4.65	0.00	3.09	2.878
2000	8.54	8.00	7.15	5.79	6.28	0.00	5.64	5.627
2001	13.13	11.80	11.09	10.66	9.99	0.00	8.64	8.767
2002	6.92	5.56	5.01	3.54	3.50	0.00	3.25	3.331
2003	8.53	7.13	6.54	5.69	5.64	0.00	5.46	5.369
2004	8.97	7.52	7.10	6.23	6.14	0.00	5.84	5.782
2005	9.58	8.94	7.32	6.37	6.37	0.00	5.88	5.88
2006	8.72	8.09	6.54	5.62	5.62	0.00	5.16	5.16
2007	8.92	8.30	6.77	5.89	5.89	0.00	5.44	5.44
2008	9.22	8.60	7.05	6.16	6.16	0.00	5.70	5.70
2009	9.02	8.39	6.83	5.93	5.93	0.00	5.46	5.46
2010	9.23	8.63	7.14	6.29	6.29	0.00	5.82	5.82
2011	9.12	8.50	7.04	6.18	6.19	0.00	5.73	5.73
2012	9.48	8.86	7.36	6.49	6.49	0.00	6.02	6.02
2013	10.11	9.50	8.01	7.15	7.15	0.00	6.68	6.68
2014	10.85	10.23	8.74	7.87	7.87	0.00	7.40	7.40
2015	10.67	10.05	8.56	7.69	7.69	0.00	7.23	7.23
2016	10.92	10.31	8.84	7.99	7.99	0.00	7.53	7.53

**Annual Growth Rates (%)**

1990-2000	1.8	0.9		1.8	2.5		3.0	2.7
2000-2003	0.0	-3.8	-3.0	-0.6	-3.5		-1.1	-1.6
2003-2008	1.6	3.8	1.5	1.6	1.8		0.8	1.2
2008-2016	2.1	2.3	2.9	3.3	3.3		3.5	3.5
2003-2016	1.9	2.9	2.4	2.6	2.7		2.5	2.6

# **CHAPTER 5**

## **SMUD PLANNING AREA**

The Sacramento Municipal Utility District (SMUD) planning area includes SMUD retail customers. For the CED 2006 forecast, the SMUD planning area is confined to Sacramento County and does not take into account proposed expansions of the SMUD service territory into Yolo County.

The SMUD planning area forecast also does not include the new members of the SMUD control area, Roseville, Redding, and the Western Area Power Administration (WAPA). To support electricity system analysis, staff derives forecasts by control area and CAISO congestion zone from the planning area forecasts. Using historic consumption data and regional population projections, the estimated share of the PG&E forecast for WAPA, Roseville, and Redding forecasts are subtracted from the PG&E planning area and added to the SMUD control area. Those results are presented in Chapter 1, Tables 1-3 and 1-4. The results in this chapter are for the SMUD planning area only.

This chapter is organized as follows. First, forecasted consumption and peak loads for the SMUD planning area are discussed; both total and per capita values are presented. The CED 2006 values are compared to the CED 2003 forecast; differences between the two forecasts are explained. The forecasted load factor, jointly determined by the consumption and peak load estimates, is also discussed. Second, sector consumption and peak load forecasts are presented. The residential, commercial, industrial and “other” sector forecasts are compared to those in CED 2003; again, differences between the two are discussed. Third, the sector electricity prices used as inputs to the CED forecast are presented.

### **Forecast Results**

Table 5-1 presents a comparison of electricity consumption and peak demand for selected years. Figures 5-1 and 5-2 present a comparison of the Staff CED 2006 forecast with the CED 2003 forecast.

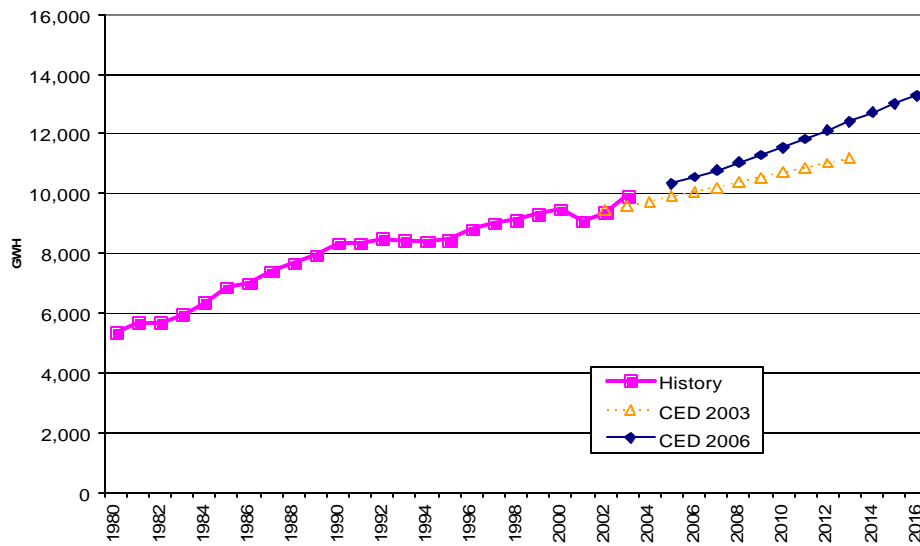
**Table 5-1**  
**SMUD Planning Area Forecast Comparison**

	Consumption (GWH)				Peak (MW)		
	CED 2003	CED 2006	%difference		CED 2003	CED 2006	%difference
1990	8,358	8,358	0.00%		2,195	2,195	0.00%
2000	9,491	9,491	0.00%		2,688	2,688	0.00%
2003	9,563	9,924	3.77%		2,657	2,809	5.75%
2008	10,388	11,035	6.23%		2,861	3,092	8.07%
2013	11,172	12,420	11.18%		3,055	3,518	15.16%
2016	n/a	13,275			n/a	3,785	
Annual Average Growth Rates							
1990-2000	1.28%	1.28%			2.05%	2.05%	
2000-2003	0.25%	1.50%			-0.39%	1.48%	
2003-2008	1.67%	2.14%			1.49%	1.94%	
2003-2013	1.57%	2.27%			1.41%	2.27%	
Historic values are shaded							

As shown in Figure 5-1, the CED 2006 electricity consumption forecast is almost 4 percent higher in 2003 than forecasted in CED 2003. This difference grows to over 11 percent by 2013. Differences between forecasts start with the base year value of 2003. The actual consumption and peak values are higher than were projected for the year 2003 in the CED 2003 forecast. This is due to both higher economic and demographic inputs in the residential and commercial sectors and a faster decline in the voluntary conservation actions taken in the energy crisis than was anticipated in the CED 2003 forecast. Recent historic economic data for the Sacramento Region indicate that there was very little impact of the recession in the SMUD planning area. Economic projections prepared for the CED 2003 forecast assumed an equal recession impact on all areas of the state by use of common statewide growth assumptions for all regions. In retrospect the recent California recession essentially only impacted the PG&E planning area (Bay Area). The Sacramento region was relatively unaffected and continued to grow the recession. In the forecast period, the major residential forecast drivers; population, households and household income, are projected to grow at a faster rate than was forecast in CED 2003. Commercial floorspace is also projected to grow at a slightly faster rate than CED 2003 projections, while industrial production drivers are forecast to be relatively similar.

The CED 2006 SMUD planning area peak demand forecast, shown in Figure 5-2, is also higher over the entire forecast period than the CED 2003 forecast. Major reasons for the higher peak forecast are the same as the higher energy forecast. A smaller contributor to the increase is due to the use of new residential and industrial load shapes to more accurately account for air conditioning use over the summer air conditioning period and use of actual SMUD load profile data to portray SMUD residential loads.

**Figure 5-1: SMUD Planning Area Electricity Forecast**



**Figure 5-2: SMUD Planning Area Peak**

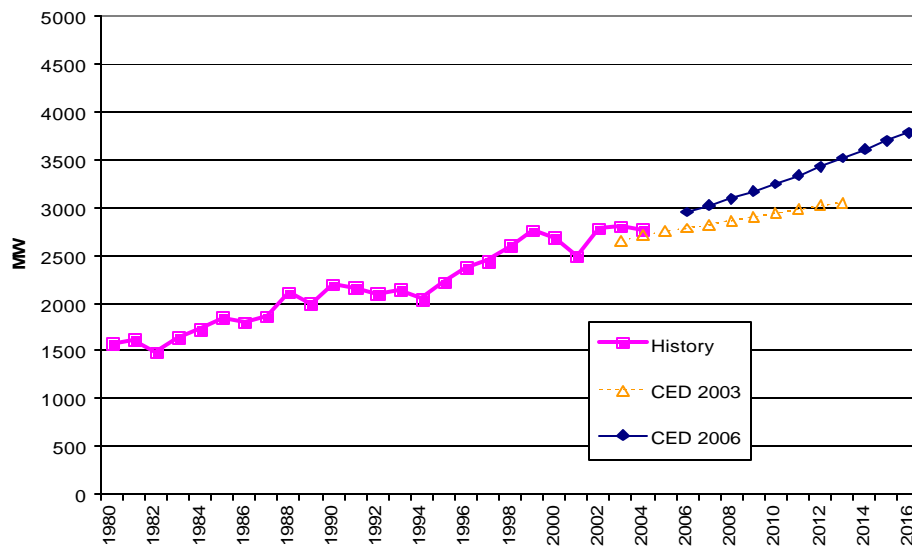
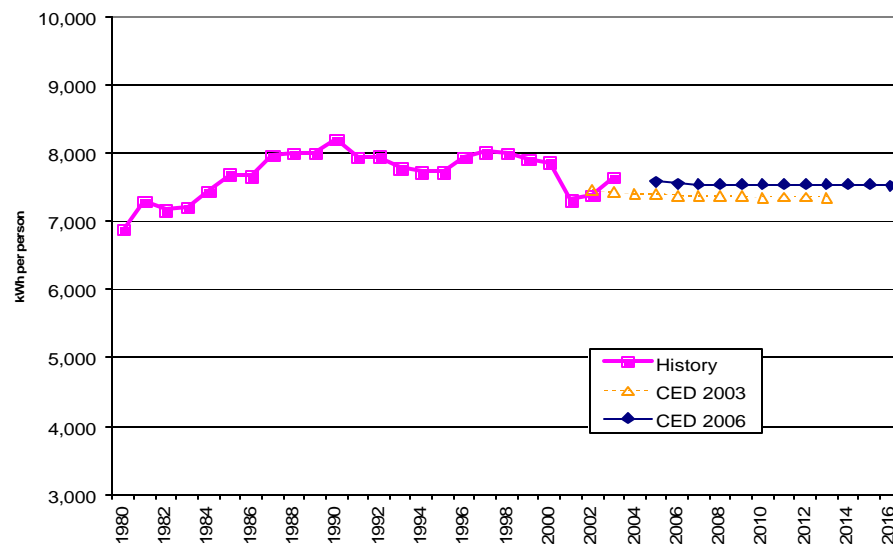


Figure 5-3 compares the old and new per capita electricity consumption forecasts for the SMUD planning area. Projected per capita consumption in the CED 2006 forecast is slightly higher than in the CED 2003 forecast. This is due to a greater rebound from the reduced consumption levels resulting from the energy crisis than was previously anticipated. After adjusting for the difference in starting level, both forecasts project a slight decline in per capita electricity consumption over the forecast period. The CED 2006 per capita electricity consumption forecast is still below pre-energy crisis levels. Unlike other larger planning areas, SMUD has uniform climate throughout its service area and thus there are no shifts toward sub-areas creating higher usage levels.

**Figure 5-3: SMUD Planning Area per Capita Electricity Consumption**



After an adjustment up in 2005 for calibration and weather adjustment, CED 2006 per capita peak demand, shown in Figure 5-4, increases slightly throughout the forecast period due to a reduction in how the peak impacts of the federal air conditioning appliance standards are modeled. This level is somewhat higher than the CED 2003 level due to a rebound from the energy crisis but still below levels seen in the mid to late 1990's.

**Figure 5-4: SMUD Planning Area per Capita Peak Demand**

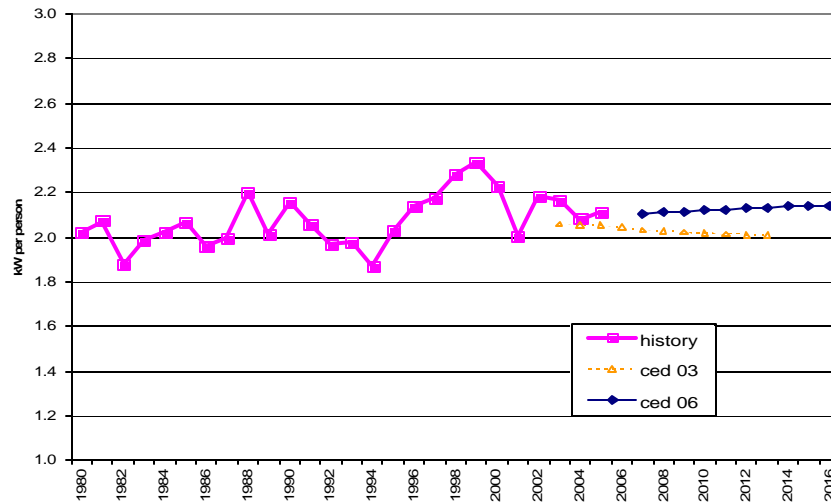
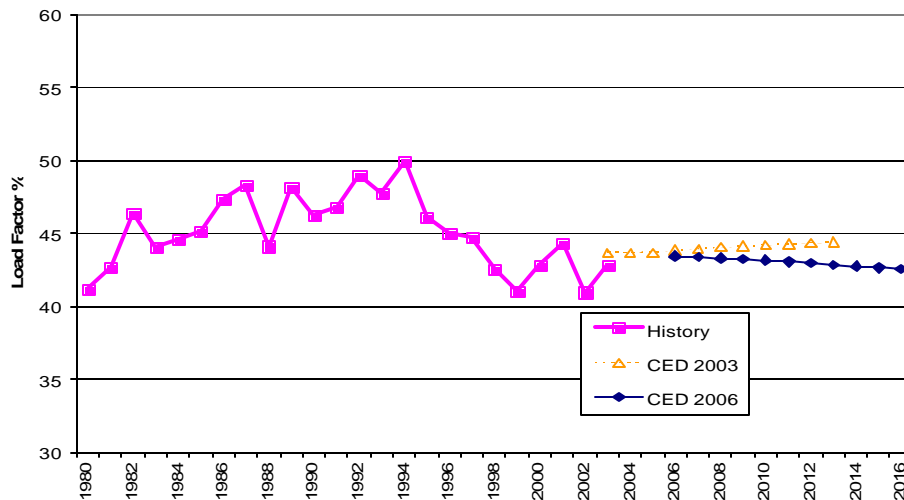


Figure 5-5 compares the load factors of the two forecasts. The load factor is a measure of the relative increase in peak demand with respect to annual electricity consumption. Lower load factors indicate more of a needle peak and higher load factors indicate a more stable load. Variation in historic load factors is caused in part by annual weather patterns. The SMUD load factor has been declining since the mid 1990s, as the residential sector grew faster than other sectors. Because of the projection of strong population growth with only small increases in baseload industrial activity, the forecasted load factor continues this decline, although at a slower rate. This reflects faster growth of weather sensitive load than base load. The CED 2006 projected load factor is on the lower end of the range of historic annual load factors when adjusted for historic weather.

**Figure 5-5: SMUD Planning Area Load Factor**



## Sector Level Results and Input Assumptions

### *Residential*

Figure 5-6 provides a comparison between the CED 2006 and CED 2003 SMUD planning area residential forecasts. The CED 2006 forecast is higher throughout the entire forecast period. The short-term difference is caused by higher actual 2003 demographic growth than was assumed in the CED 2003 forecast. This difference increases over time because the CED 2006 economic and demographic projections for the SMUD planning area grow at a faster rate than the previous forecast. Part of the higher 2003 starting point is caused by a greater than anticipated rebound from the energy crisis than was projected in the previous forecast.

**Figure 5-6: SMUD Planning Area Residential Consumption**

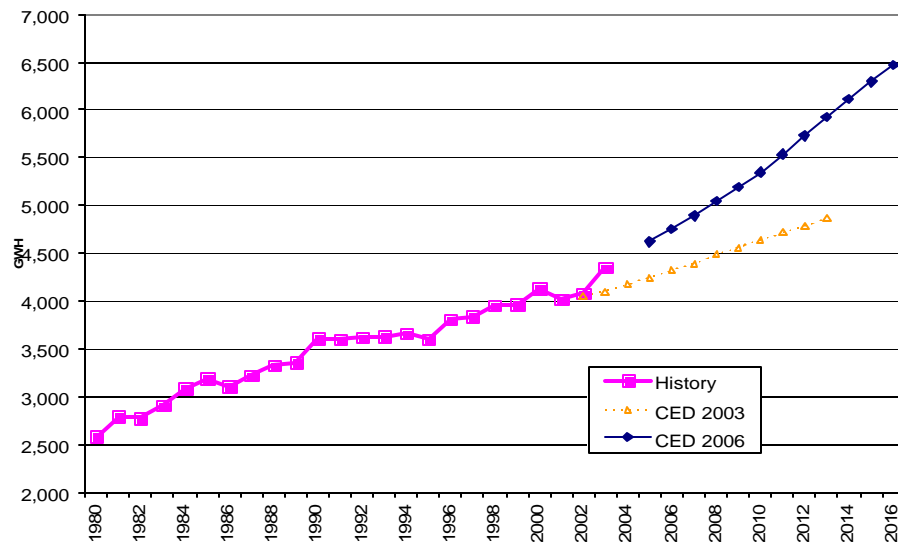
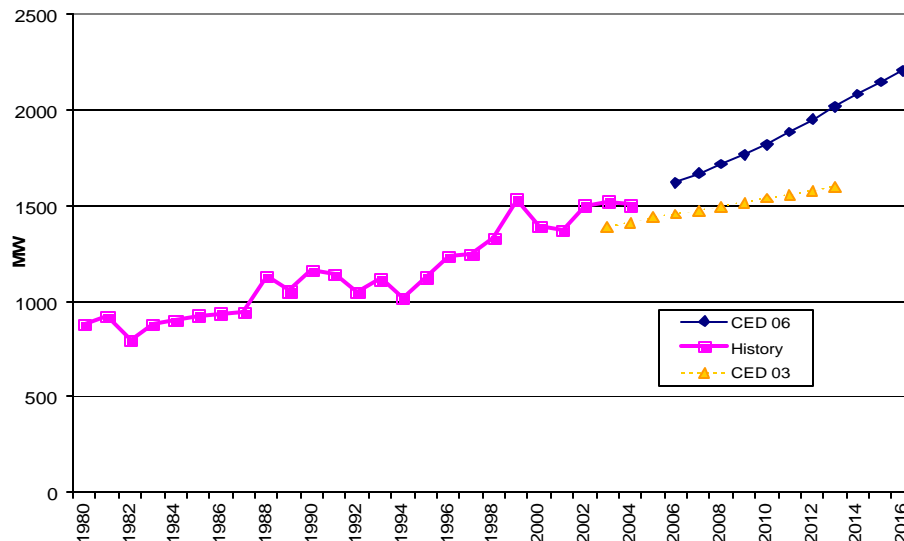




Figure 5-7 provides a comparison of the CED 2006 and CED 2003 residential peak demand forecasts. As in the electricity consumption forecast, the CED 2006 residential peak forecast is higher than the CED 2003 forecast. The difference between the two peak forecasts is driven by the difference in electricity consumption forecasts.

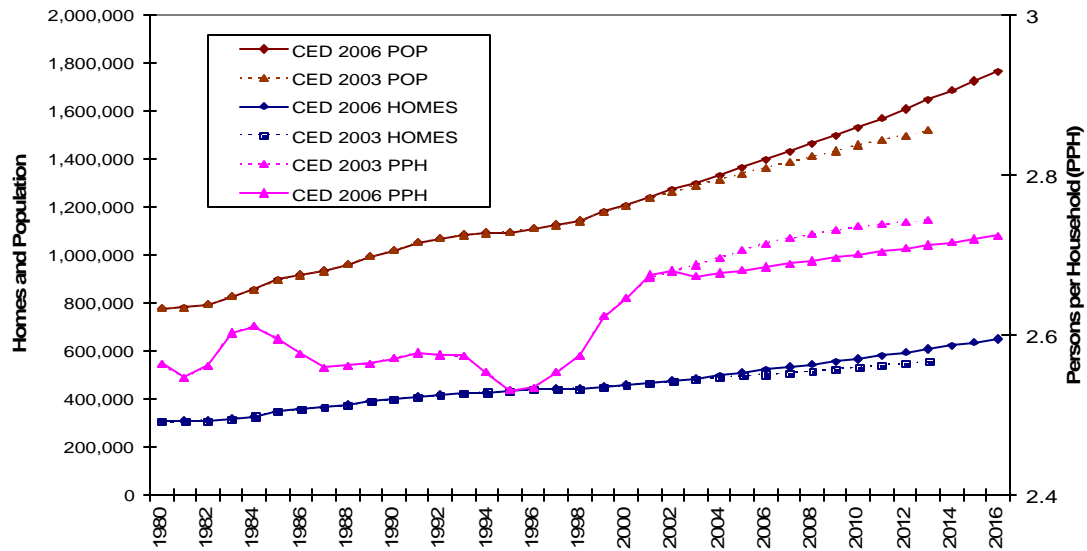
**Figure 5-7: SMUD Planning Area Residential Peak**



Figures 5-8 and 5-9 provide comparisons of the residential drivers used in the CED 2006 forecast with drivers used in CED 2003. Figure 5-8 provides comparisons of total population, total households and persons per household projections. The CED 2006 forecast has higher projections of total population than assumed in the previous forecast after 2006 due to a new DOF long term population forecast. In addition, staff has reduced the previous assumptions of increasing persons per household to approximately half of the increase seen in the 1990-2000 period. The reduction in assumptions about increasing household size combined with a higher population produce a slightly higher household forecast than was projected in CED 2003.

Figure 5-9 provides a comparison of household income between the two forecasts. Household income is derived as the product of per capita income and persons per household. The CED 2006 projection is higher in the short to mid-term projection period because of the use of regional economic forecast data. These data show that, unlike the PG&E planning area, there was virtually no downturn in household income in the SMUD planning area during the recent recession. This higher household income serves to increase the residential forecast over the entire forecast period.

**Figure 5-8: SMUD Planning Area Residential Demographic Projections**



**Figure 5-9: SMUD Planning Area Household Income Projections**

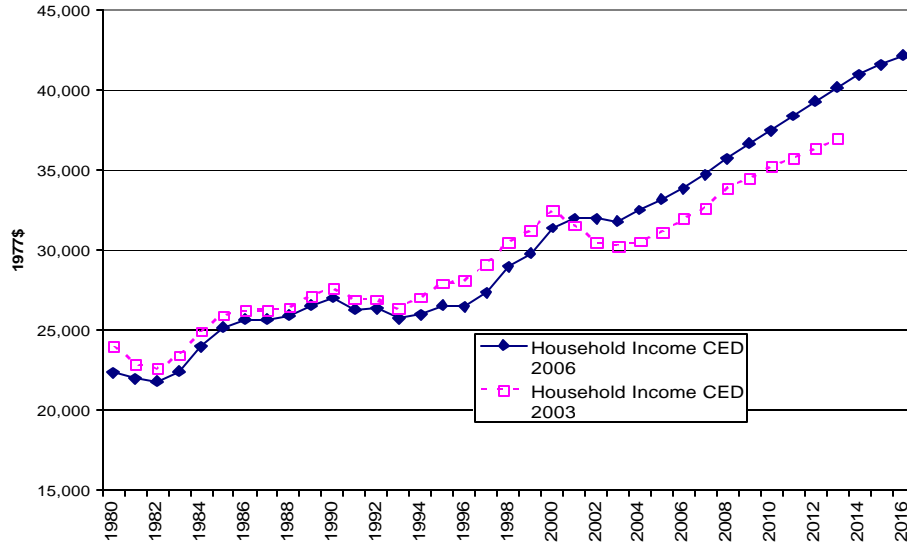
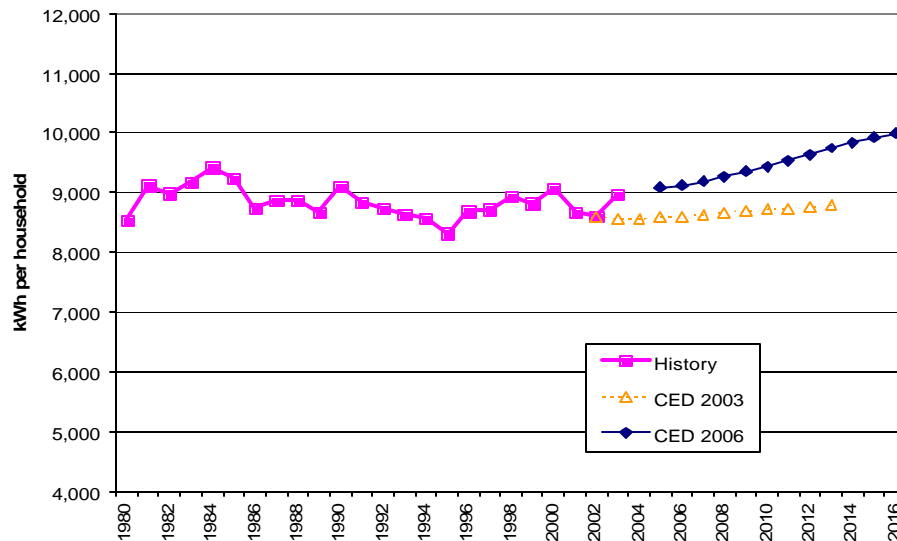


Figure 5-10 presents a comparison of electricity use per household between the two forecasts as well as the 1980-2003 historic series. The CED 2006 forecast of use per household starts at a higher level because both recent actual income and the short-term household income projections are higher than projected in CED 2003. The CED 2006 forecasted growth rate is higher than the CED 2003 forecast due to increased household income projections.

**Figure 5-10: SMUD Planning Area Electricity Use per Household**

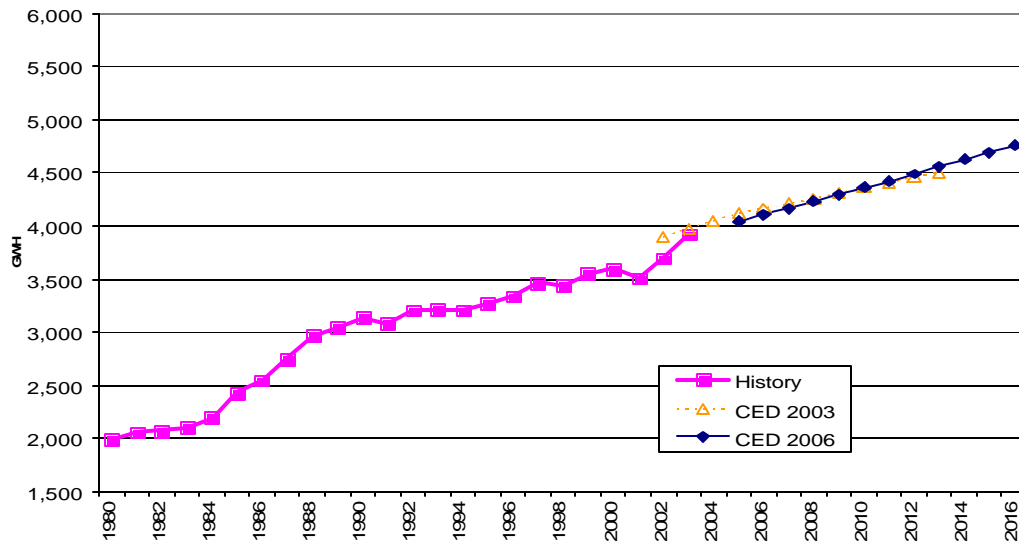


## ***Commercial Building Sector***

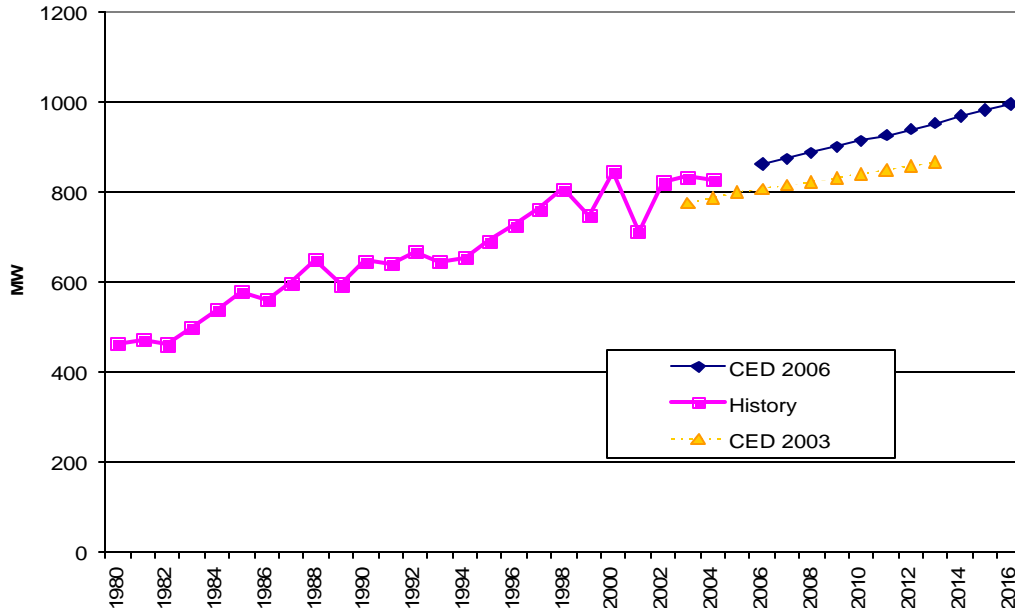
Figure 5-11 provides a comparison of the commercial building sector forecasts. The CED 2006 forecast is slightly lower in the short term due to a lower starting point than was projected in the CED 2003 forecast. The growth rate of the CED 2006 forecast is slightly higher than the previous. The increase is due to an increase in projected commercial square footage which is somewhat offset by impacts of the 1998, 2001 and 2005 commercial building standards. The net result is a slightly higher forecast in the long run than was projected in the CED 2003 forecast.

Figure 5-12 provides a comparison of the commercial peak demand forecasts. The CED 2006 commercial peak forecast is higher throughout the forecast period due to a higher starting point brought about by the use of SMUD sector specific load profiles for calibration. The growth rates of the two commercial peak forecast are essentially the same.

**Figure 5-11: SMUD Planning Area  
Commercial Building Consumption**

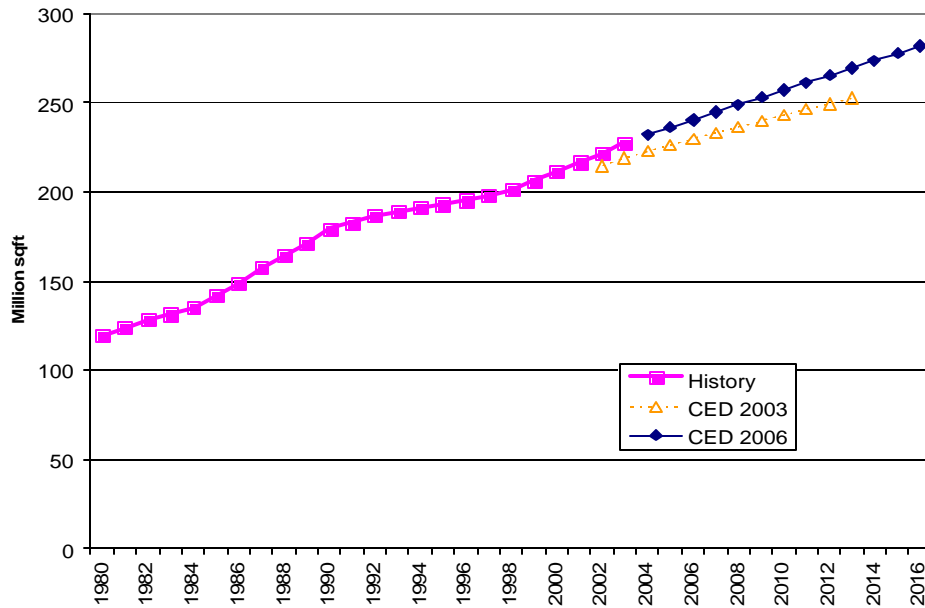


**Figure 5-12: SMUD Planning Area  
Commercial Building Sector Peak**



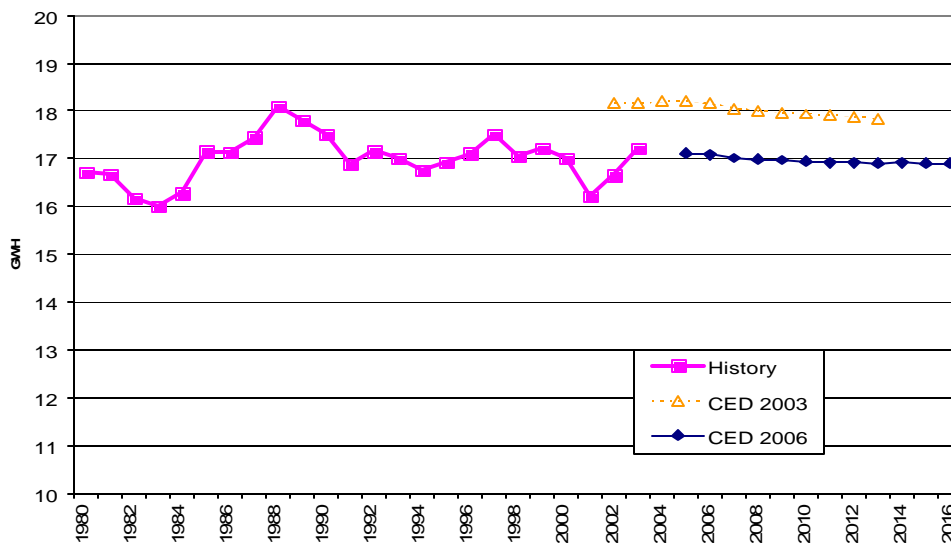
In staff's commercial building sector forecasting model, floorspace by building type (e.g. retail, offices, schools, hospitals, etc) is the key driver of electricity growth. Figure 5-13 provides a comparison of total commercial floorspace projections. The CED 2006 floorspace projections are higher over the forecast period than those used in CED 2003.

**Figure 5-13: SMUD Planning Area Commercial Floorspace**



This higher floorspace projection is somewhat offset by a decline in projected use per square foot, shown in Figure 5-14, over the forecast period. This decline is a result of inclusion of the estimated impacts from the 1998 through 2005 iterations of the commercial building and appliance standards.

**Figure 5-14: SMUD Planning Area Commercial kWh per Square Foot**



## Industrial Sector

Figure 5-15 provides comparisons of the SMUD planning area industrial sector electricity consumption forecasts. The CED 2006 industrial electricity consumption forecast is higher throughout the entire forecast period than the CED 2003 forecast, although the growth rate of the CED 2006 forecast is lower than the CED 2003 forecast. The higher forecast is a result of a higher starting point than was projected by the CED 2003 forecast. This is essentially the opposite of the commercial building sector forecast comparisons and may be due to the recent reclassification of some nonresidential activities brought about by the conversion of SIC based classification to NAICS based classification.<sup>1</sup>

**Figure 5-15: SMUD Planning Area Industrial Consumption**

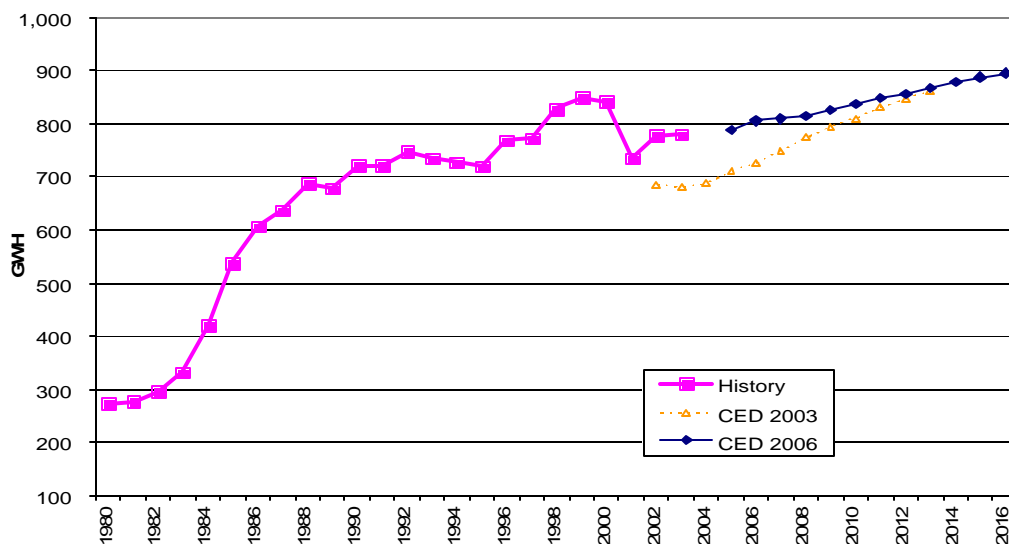


Figure 5-16 provides a comparison of the industrial sector peak forecasts. In contrast to the consumption forecasts, the CED 2006 forecast starts from a lower initial 2003 value and is lower throughout the forecast period. The lower initial starting value is due to using sector specific load profile data to calibrate the CED 2006 forecast in order to more accurately reflect actual industrial loads. The CED 2006 industrial peak forecast growth rates are nearly the same.

**Figure 5-16: SMUD Planning Area Industrial Sector Peak**

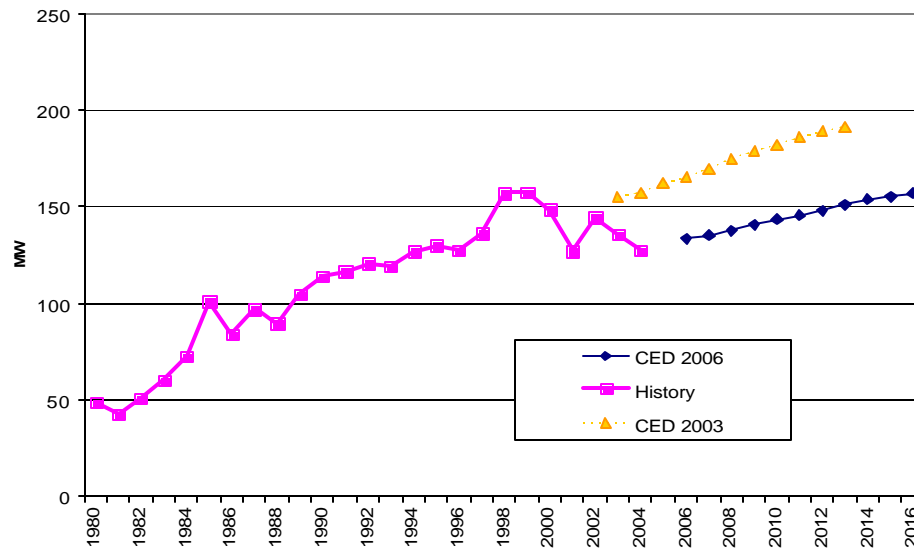
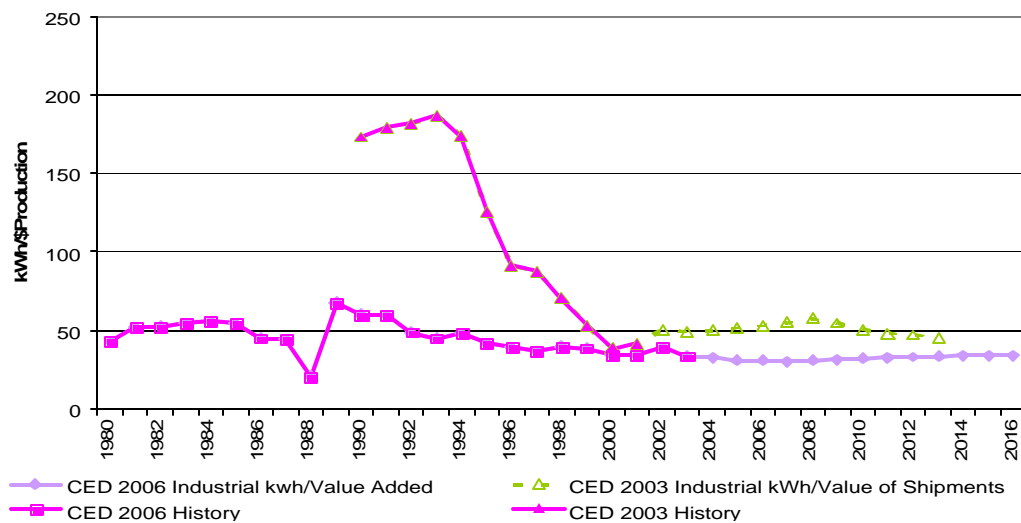


Figure 5-17 provides a comparison of use per dollar value of production between the CED 2006 and CED 2003 forecasts. Two changes were made in the economic drivers used to forecast industrial energy demand. First, the CED 2003 forecast used value of shipments provided by the UCLA Anderson School of Business. The CED 2006 forecast uses value added provided by the October 2004 Economy.com projections. Staff switched to the Economy.com economic projections because the economic drivers are provided at county and MSA levels of disaggregation. It is apparent from the historic county level economic drivers that there are major differences in economic activity in the various regions of California. This enables the CED 2006 forecast to assume different patterns of economic activity in the separate utility planning areas. The UCLA forecast is only provided at a statewide level. Translation of the UCLA forecast to individual regions was not considered critical during the hiatus in formal planning prior to enactment of SB 1389 and thus for the CED 2003, energy forecasts staff prepared economic projections that grew at the same rate for all parts of the state. With the resumption of planning area-based energy assessments in this 2005 *Energy Report* cycle, staff shifted back to preparation of economic/demographic projections tailored to the various sub-regions of the state.

Second, the Economy.com projections use value added as the descriptor of industrial activity, rather than value of shipments. Not only are these two descriptors different in absolute values, but as shown in Figure 5-17 the pattern of the difference changes through time. Electricity used per dollar of industrial value added in the CED 2006 industrial forecast is projected to remain relatively constant over the forecast period. This is in contrast to the slight increase followed by a decline shown in the CED 2003 forecast, and also in contrast to the rapid decline shown in the 1994-2000 period of value of shipments.

**Figure 5-17: SMUD Planning Area  
Industrial Use per Production Unit**

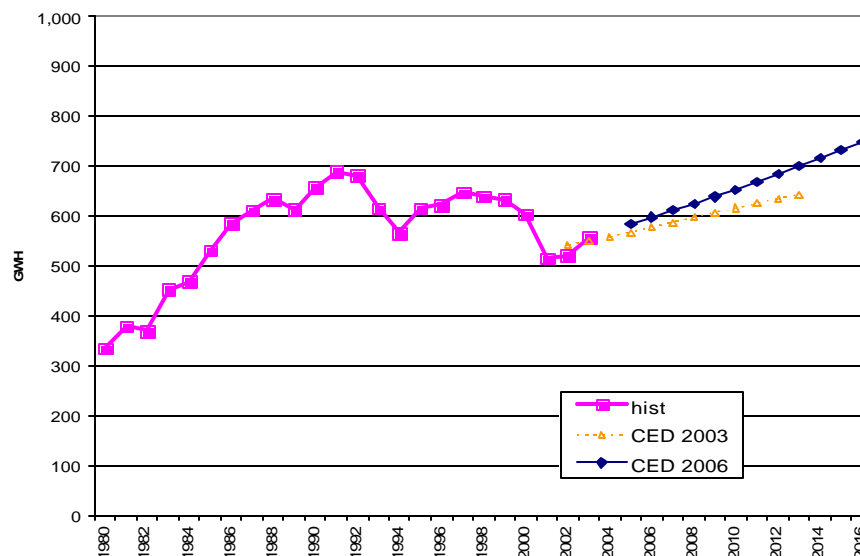




## Other Sectors

Figures 5-18 and 5-19 provide comparisons of the remaining sector electricity consumption forecasts. Figure 5-18 provides a comparison of the transportation, communication and utilities (TCU) sector forecasts. The CED 2006 TCU forecast is higher than the CED 2003 forecast due to an increased historic starting point. The CED 2006 forecasted growth rate is also higher because of the higher population forecast. Because of lack of accurate historic information, the TCU sector was forecasted at an overall sector level driven by population rather than at a detailed industry level as in previous forecasts. Figure 5-19 provides comparisons of the agriculture & water pumping (ag. & water pumping) and mining & oil extraction sector forecasts. The CED 2006 ag. & water pumping forecast is higher than the CED 2003 forecast due to increased pumping assumptions and a projected decrease in agricultural electricity rates. The CED 2006 mining and oil extraction forecast is also higher than the CED 2003 forecast.

**Figure 5-18: SMUD Planning Area  
Transportation, Communication & Utilities Sector  
Electricity Consumption**



**Figure 5-19: SMUD Planning Area  
Agriculture & Water Pumping and Mining & Oil Extraction  
Electricity Consumption Forecasts**

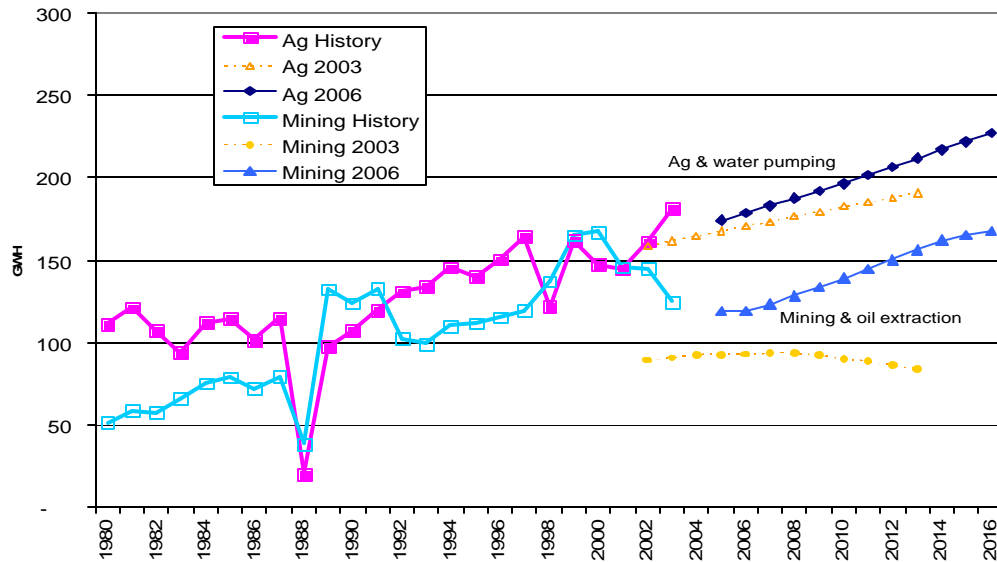
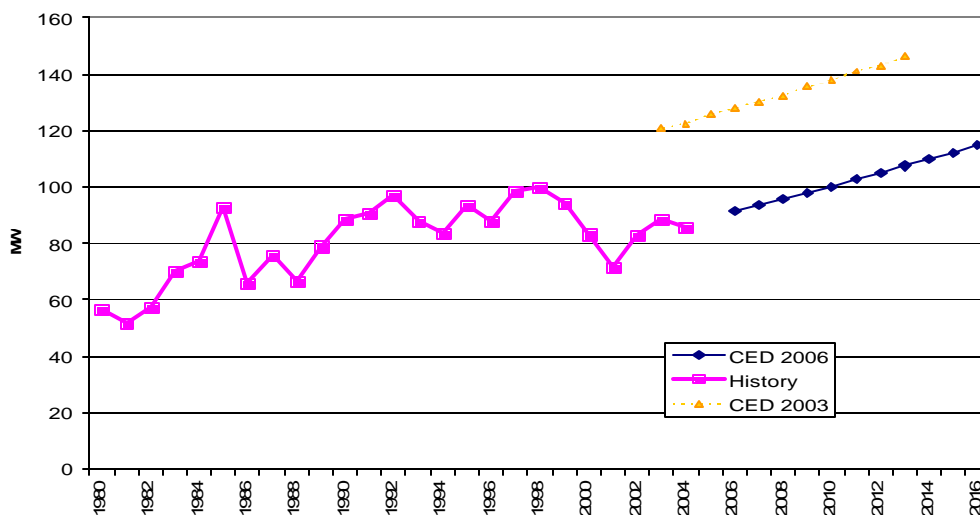


Figure 5-20 provides a comparison of the combined Other Sector peaks for the CED 2006 and CED 2003 forecasts. The CED 2006 forecast is lower over the entire forecast period than the CED 2003 due to a lower assumed starting point. However the growth rate of the CED 2006 forecast is essentially the same as the CED 2003 forecast. Clearly the absolute values for the forecast are sensitive to historic values that have not been accurately understood.

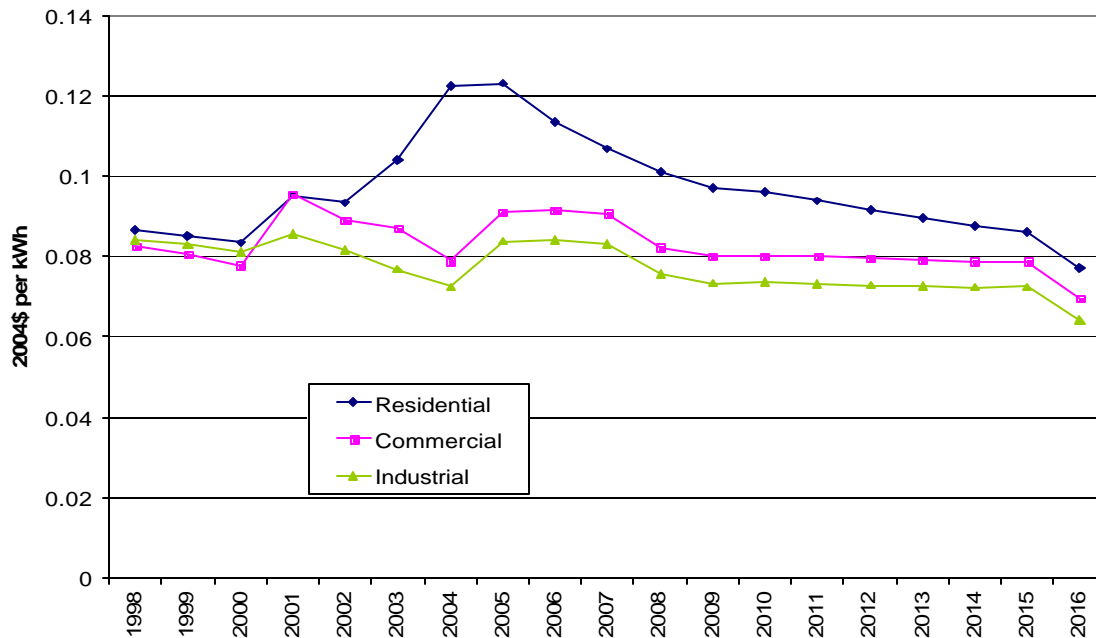
**Figure 5-20: SMUD Planning Area Other Sector Peak**



## Electricity Prices

Figure 5-21 shows the sector prices used in the CED 2006 forecast for the SMUD planning area. These electricity prices are based on information provided by SMUD.

**Figure 5-21**  
**SMUD Planning Area Prices**



<sup>1</sup> As a result of NAFTA, the federal government replaced the SIC system with the NAICS system. In turn, the CEC modified its regulations requiring utilities to classify all end-users from SIC to NAICS to allow economic data to be matched to utility consumption data.

**Form 1.1 - SMUD**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Electricity Consumption by Sector (GWh)**

Year	Residential	Commercial	Industrial	Mining	Agricultural	TCU	Streetlighting	Total Consumption
1980	2,587	1,994	274	52	111	278	56	5,352
1981	2,794	2,064	278	59	122	322	56	5,695
1982	2,781	2,071	297	58	107	311	58	5,683
1983	2,910	2,102	332	67	94	396	56	5,956
1984	3,086	2,200	420	75	113	415	53	6,362
1985	3,193	2,428	538	79	115	476	56	6,884
1986	3,107	2,543	607	73	102	528	57	7,016
1987	3,229	2,749	636	80	115	552	59	7,419
1988	3,326	2,969	688	39	21	574	60	7,677
1989	3,359	3,046	679	133	98	550	62	7,927
1990	3,611	3,138	721	124	107	589	67	8,358
1991	3,603	3,083	721	133	120	620	68	8,349
1992	3,626	3,208	748	103	131	611	68	8,496
1993	3,636	3,216	734	100	134	547	68	8,435
1994	3,662	3,207	727	110	146	495	71	8,418
1995	3,604	3,268	719	112	140	542	72	8,458
1996	3,808	3,342	768	116	151	547	75	8,805
1997	3,839	3,464	772	119	164	572	75	9,006
1998	3,959	3,437	828	138	122	564	75	9,123
1999	3,966	3,551	849	165	162	553	80	9,326
2000	4,135	3,596	842	167	147	523	81	9,491
2001	4,019	3,511	735	146	145	436	79	9,070
2002	4,087	3,692	778	145	162	441	79	9,383
2003	4,361	3,921	780	125	181	476	80	9,924
2006	4,751	4,106	809	119	179	513	84	10,562
2007	4,892	4,162	814	123	183	525	85	10,785
2008	5,043	4,226	826	129	188	537	87	11,035
2009	5,196	4,294	838	134	192	549	89	11,291
2010	5,351	4,359	848	139	197	562	90	11,545
2011	5,536	4,421	856	145	202	576	92	11,828
2012	5,728	4,488	866	150	207	590	93	12,122
2013	5,921	4,554	877	157	212	605	95	12,420
2014	6,114	4,627	887	162	217	619	97	12,723
2015	6,294	4,693	895	165	222	633	98	13,001
2016	6,472	4,758	901	168	227	648	100	13,275

**Annual Growth Rates (%)**

1980-1990	3.4	4.6	10.2	9.1	-0.4	7.8	1.8	4.6
1990-2000	1.4	1.4	1.6	3.0	3.2	-1.2	1.9	1.3
2000-2003	1.8	2.9	-2.5	-9.3	7.2	-3.1	-0.6	1.5
2003-2008	2.9	1.5	1.1	0.6	0.7	2.4	1.8	2.1
2008-2016	3.2	1.5	1.1	3.4	2.4	2.4	1.8	2.3
2003-2016	3.1	1.5	1.1	2.3	1.7	2.4	1.8	2.3

**Form 1.2 - SMUD**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Net Energy for Load (GWh)**

Year	Total Consumption	Net Losses	Gross Generation	Private Supply	Net Energy for Load
1980	5,352	343	5,695	0	5,695
1981	5,695	364	6,059	0	6,059
1982	5,683	364	6,047	0	6,047
1983	5,956	381	6,337	0	6,337
1984	6,362	407	6,769	0	6,769
1985	6,884	441	7,325	0	7,325
1986	7,016	449	7,465	0	7,465
1987	7,419	475	7,894	0	7,894
1988	7,677	491	8,168	0	8,168
1989	7,927	507	8,434	0	8,434
1990	8,358	535	8,893	0	8,893
1991	8,349	534	8,884	0	8,884
1992	8,496	544	9,040	0	9,040
1993	8,435	540	8,974	0	8,974
1994	8,418	539	8,957	0	8,957
1995	8,458	541	8,999	0	8,999
1996	8,805	564	9,369	0	9,369
1997	9,006	576	9,583	0	9,583
1998	9,123	584	9,707	0	9,707
1999	9,326	597	9,923	0	9,923
2000	9,491	607	10,098	0	10,098
2001	9,070	580	9,651	0	9,651
2002	9,383	601	9,984	0	9,984
2003	9,924	635	10,559	0	10,559
2006	10,562	676	11,238	0	11,238
2007	10,785	690	11,475	0	11,475
2008	11,035	706	11,741	0	11,741
2009	11,291	723	12,014	0	12,014
2010	11,545	739	12,284	0	12,284
2011	11,828	757	12,585	0	12,585
2012	12,122	776	12,898	0	12,898
2013	12,420	795	13,215	0	13,215
2014	12,723	814	13,537	0	13,537
2015	13,001	832	13,833	0	13,833
2016	13,275	850	14,125	0	14,125

**Annual Growth Rates (%)**

1980-1990	4.6	4.6	4.6	4.6
1990-2000	1.3	1.3	1.3	1.3
2000-2003	1.5	1.5	1.5	1.5
2003-2008	2.1	2.1	2.1	2.1
2008-2016	2.4	2.4	2.4	2.4
2003-2016	2.3	2.3	2.3	2.3

**Form 1.3 - SMUD**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Coincident Peak Demand by Sector (MW)**

Year	Residential		Commercial		Industrial			Total Industrial	Agr.	TCU & Street-lighting	Total
	Base Load	Weather Sensitive	Base Load	Weather Sensitive	Process	Assembly	Mining				
1990	481	683	390	256	33	57	25	114	11	78	2,013
1991	467	674	382	257	27	64	25	117	12	79	1,987
1992	441	603	415	252	33	68	19	121	14	84	1,929
1993	434	682	411	234	32	68	19	119	14	74	1,968
1994	507	505	433	219	26	78	22	127	16	68	1,875
1995	474	650	437	254	32	75	23	130	15	79	2,039
1996	440	794	417	310	31	74	22	127	15	73	2,177
1997	474	768	453	310	30	82	24	136	18	81	2,240
1998	525	802	504	302	31	99	28	157	14	86	2,390
1999	573	959	478	269	30	97	30	157	17	78	2,531
2000	528	861	531	314	30	91	28	149	13	70	2,466
2001	568	801	444	267	24	79	24	127	14	58	2,279
2002	658	843	510	311	28	88	28	145	17	66	2,549
2003	657	863	514	319	23	87	26	136	19	70	2,577
2004	566	938	510	316	22	83	22	128	17	69	2,543
2006	614	1,007	534	328	23	87	23	133	18	74	2,708
2007	633	1,033	541	332	23	88	24	135	18	75	2,768
2008	655	1,062	550	336	24	89	25	138	19	77	2,836
2009	676	1,092	559	341	24	91	26	141	19	79	2,907
2010	698	1,123	568	345	24	92	27	143	19	81	2,977
2011	723	1,161	577	349	24	93	28	146	20	83	3,058
2012	750	1,199	586	353	25	94	29	148	20	85	3,141
2013	777	1,239	595	358	25	95	31	151	21	87	3,227
2014	804	1,278	605	363	25	97	32	154	21	89	3,313
2015	829	1,317	614	367	26	97	32	155	21	91	3,394
2016	854	1,352	623	371	26	98	33	157	22	93	3,472

**Annual Growth Rates (%)**

1980-1990	1.8	3.7	2.9	4.3	3.3	15.9	7.5	8.9	-2.7	6.3	3.4
1990-2000	0.9	2.3	3.1	2.1	-0.8	4.8	1.3	2.7	1.5	-1.0	2.0
2000-2001	7.7	-7.0	-16.3	-14.9	-22.0	-12.7	-12.2	-14.5	6.6	-18.1	-7.6
2000-2003	7.5	0.1	-1.1	0.5	-8.6	-1.3	-2.8	-3.0	12.9	-0.2	1.5
2003-2008	-0.1	4.2	1.4	1.1	0.5	0.5	-0.7	0.3	0.0	2.1	1.9
2008-2016	3.4	3.1	1.6	1.3	1.1	1.2	3.6	1.6	1.9	2.3	2.6
2003-2016	2.0	3.5	1.5	1.2	0.8	0.9	2.0	1.1	1.2	2.2	2.3

**Form 1.4 - SMUD**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Peak Demand (MW)**

Year	Total End Use Load	Net Losses	Gross Generation	Private Supply	Net Peak Demand	Load Factor (%)
1980	1,445	133	1,578	0	1,578	41.2
1981	1,484	137	1,621	0	1,621	42.7
1982	1,365	126	1,491	0	1,491	46.3
1983	1,506	139	1,645	0	1,645	44.0
1984	1,586	146	1,732	0	1,732	44.6
1985	1,698	156	1,854	0	1,854	45.1
1986	1,648	152	1,800	0	1,800	47.4
1987	1,710	157	1,867	0	1,867	48.3
1988	1,937	178	2,115	0	2,115	44.1
1989	1,831	168	1,999	0	1,999	48.2
1990	2,013	185	2,198	0	2,198	46.2
1991	1,987	183	2,170	0	2,170	46.7
1992	1,929	177	2,106	0	2,106	49.0
1993	1,968	181	2,149	0	2,149	47.7
1994	1,875	172	2,047	0	2,047	49.9
1995	2,039	188	2,227	0	2,227	46.1
1996	2,177	200	2,377	0	2,377	45.0
1997	2,240	206	2,446	0	2,446	44.7
1998	2,390	220	2,610	0	2,610	42.5
1999	2,531	233	2,764	0	2,764	41.0
2000	2,466	227	2,693	0	2,693	42.8
2001	2,279	210	2,489	0	2,489	44.3
2002	2,549	235	2,784	0	2,784	40.9
2003	2,577	237	2,814	0	2,814	42.8
2004	2,543	234	2,777	0	2,777	44.4
2006	2,708	249	2,957	0	2,957	43.4
2007	2,768	255	3,023	0	3,023	43.3
2008	2,836	261	3,097	0	3,097	43.3
2009	2,907	267	3,174	0	3,174	43.2
2010	2,977	274	3,251	0	3,251	43.1
2011	3,058	281	3,339	0	3,339	43.0
2012	3,141	289	3,430	0	3,430	42.9
2013	3,227	297	3,524	0	3,524	42.8
2014	3,313	305	3,618	0	3,618	42.7
2015	3,394	312	3,707	0	3,707	42.6
2016	3,472	319	3,791	0	3,791	42.5

**Annual Growth Rates (%)**

1980-1990	3.4	3.4	3.4	3.4
1990-2000	2.0	2.0	2.0	2.0
2000-2003	1.5	1.5	1.5	1.5
2003-2008	1.9	1.9	1.9	1.9
2008-2016	2.6	2.6	2.6	2.6
2003-2016	2.3	2.3	2.3	2.3

**Form 1.5 - SMUD**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Noncoincident Peak Demand Temperature Scenarios**

Year	1-in-2 Temperatures	1-in-5 Temperatures	1-in-10 Temperatures	1-in-20 Temperatures	1-in-5 Multiplier	1-in-10 Multiplier	1-in-20 Multiplier
2006	2,957	3,092	3,254	3,361	1.046	1.101	1.137
2007	3,023	3,161	3,327	3,436	1.046	1.101	1.137
2008	3,097	3,238	3,409	3,520	1.046	1.101	1.137
2009	3,174	3,319	3,493	3,608	1.046	1.101	1.137
2010	3,251	3,399	3,578	3,695	1.046	1.101	1.137
2011	3,339	3,491	3,675	3,795	1.046	1.101	1.137
2012	3,430	3,587	3,775	3,899	1.046	1.101	1.137
2013	3,524	3,684	3,878	4,005	1.046	1.101	1.137
2014	3,618	3,782	3,981	4,112	1.046	1.101	1.137
2015	3,707	3,875	4,079	4,213	1.046	1.101	1.137
2016	3,791	3,964	4,172	4,309	1.046	1.101	1.137



**Form 2.2 - SMUD**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Planning Area Economic and Demographic Assumptions**

Year	Population	Households	Persons per Household	Per Capita Income (2003\$)	Industrial Value Added (Millions 2003\$)
1980	777,293	303,167	2.564	21,592	1,215
1981	780,352	306,447	2.546	21,406	1,145
1982	792,948	309,611	2.561	21,111	1,103
1983	825,773	317,329	2.602	21,361	1,219
1984	854,930	327,533	2.610	22,765	1,350
1985	895,717	345,209	2.595	24,032	1,454
1986	915,570	355,372	2.576	24,714	1,607
1987	931,933	364,140	2.559	24,900	1,805
1988	959,537	374,667	2.561	25,108	1,886
1989	992,208	387,052	2.564	25,704	1,956
1990	1,018,433	396,134	2.571	26,058	2,063
1991	1,051,318	407,886	2.577	25,280	2,240
1992	1,068,645	415,085	2.575	25,386	2,105
1993	1,083,913	421,153	2.574	24,798	2,210
1994	1,090,144	427,082	2.553	25,257	2,282
1995	1,095,152	432,887	2.530	26,016	2,682
1996	1,109,749	438,011	2.534	25,905	2,933
1997	1,123,820	440,189	2.553	26,567	3,225
1998	1,140,219	443,015	2.574	27,921	3,458
1999	1,179,070	449,589	2.623	28,201	4,251
2000	1,206,623	456,011	2.646	29,421	4,837
2001	1,240,393	463,721	2.675	29,696	4,291
2002	1,271,672	474,540	2.680	29,587	3,688
2003	1,298,220	485,630	2.673	29,495	3,709
2004	1,331,409	497,329	2.677	30,130	3,788
2005	1,364,600	508,995	2.681	30,705	3,899
2006	1,397,789	520,623	2.685	31,273	3,975
2007	1,430,980	532,218	2.689	32,052	4,056
2008	1,464,168	543,779	2.693	32,930	4,161
2009	1,497,358	555,305	2.696	33,733	4,259
2010	1,530,548	566,796	2.700	34,448	4,355
2011	1,569,630	580,433	2.704	35,221	4,444
2012	1,608,713	594,031	2.708	36,002	4,541
2013	1,647,797	607,588	2.712	36,739	4,641
2014	1,686,881	621,104	2.716	37,458	4,737
2015	1,725,963	634,578	2.720	37,966	4,823
2016	1,765,045	648,013	2.724	38,443	4,903

**Annual Growth Rates (%)**

1980-1990	2.7	2.7	0.0	1.9	5.4
1990-2000	1.7	1.4	0.3	1.2	8.9
2000-2003	2.5	2.1	0.3	0.1	-8.5
2003-2008	2.4	2.3	0.1	2.2	2.3
2008-2016	2.4	2.2	0.1	2.0	2.1
2003-2016	2.4	2.2	0.1	2.1	2.2

**Form 2.3a - SMUD**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Electricity Rate Forecast (2003 cents/kwh)**

Year	GDP Implicit Price Deflator	Residential	Commercial	Industrial
1990	75.49	10.88	0.00	9.32
1991	78.13	10.48	0.00	9.08
1992	79.92	10.26	0.00	8.92
1993	81.77	9.36	0.00	8.09
1994	83.51	9.60	0.00	8.35
1995	85.22	9.57	0.00	8.18
1996	86.83	9.55	0.00	8.02
1997	88.28	8.74	0.00	8.51
1998	89.26	8.65	8.26	8.41
1999	90.54	8.52	8.05	8.29
2000	92.52	8.34	7.77	8.12
2001	94.74	9.52	9.56	8.57
2002	96.31	9.34	8.91	8.17
2003	98.07	10.40	8.71	7.69
2004	100.00	12.24	7.89	7.24
2005	101.51	12.31	9.10	8.38
2006	103.64	11.36	9.16	8.40
2007	105.58	10.69	9.07	8.30
2008	107.36	10.10	8.23	7.57
2009	109.26	9.70	8.00	7.33
2010	111.24	9.60	8.00	7.37
2011	113.25	9.39	8.00	7.33
2012	115.23	9.17	7.94	7.28
2013	117.23	8.97	7.89	7.25
2014	119.25	8.77	7.89	7.24
2015	121.31	8.60	7.88	7.25
2016	123.42	7.72	6.96	6.41

**Annual Growth Rates (%)**

1990-2000	2.1	-2.6		-1.4
2000-2003	2.0	7.6	3.9	-1.8
2003-2008	1.8	-0.6	-1.1	-0.3
2008-2016	1.8	-3.3	-2.1	-2.1
2003-2016	1.8	-2.3	-1.7	-1.4

# CHAPTER 6

## LADWP PLANNING AREA

The Los Angeles Department of Water and Power (LADWP) planning area includes LADWP bundled retail customers and customers served by any energy service providers (ESP's) using the LADWP distribution system to deliver electricity to end-users.

This chapter is organized similar to previous chapters. First, forecasted consumption and peak loads for the LADWP planning area are discussed; both total and per capita values are presented. The CED 2006 values are compared to the CED 2003 forecast; significant differences between the two forecasts are explained. The forecasted load factor, jointly determined by the consumption and peak load estimates, is also discussed. Second, sector consumption and peak load forecasts are presented. The residential, commercial, industrial and "other" sector forecasts are compared to those in CED 2003; again, significant differences between the two are discussed. Third, the sector electricity prices used as inputs to the CED 2006 forecast are presented. Finally, the implications of the potential inaccuracy of historical data for the forecast are discussed.

### Forecast Results

Table 6-1 presents a comparison of electricity consumption and peak demand for selected years. Figures 6-1 and 6-2 present a graphical comparison of the annual energy consumption and peak demand forecasts, respectively.

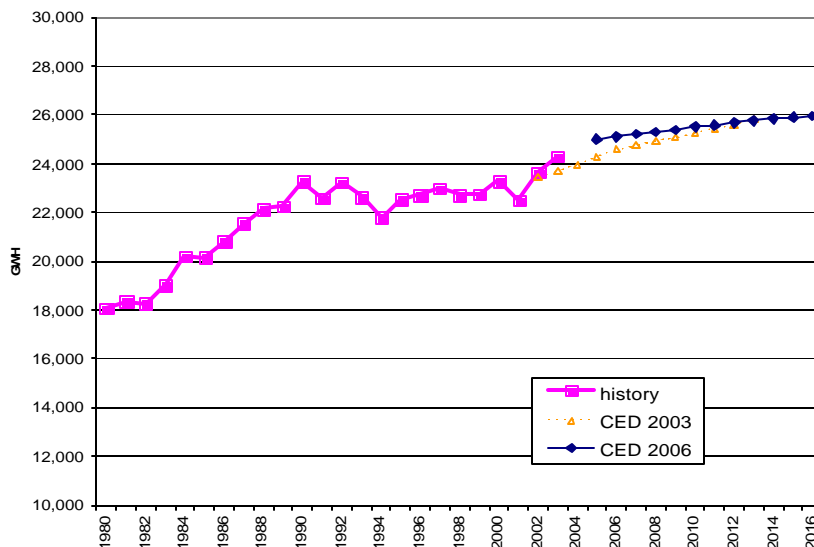
**Table 6-1: LADWP Planning Area Forecast Comparison**

	Consumption (GWH)				Peak (MW)		
	CED 2003	CED 2006	%difference		CED 2003	CED 2006	%difference
1990	21,971	23,263	5.88%		4,803	5,281	9.95%
2000	23,803	23,296	-2.13%		5,344	5,330	-0.27%
2003	23,703	24,285	2.46%		5,372	5,378	0.12%
2008	24,935	25,296	1.45%		5,588	5,701	2.03%
2013	25,839	25,752	-0.34%		5,731	5,795	1.11%
2016	n/a	25,969			n/a	5,841	
Annual Average Growth Rates							
1990-2000	0.80%	0.01%			1.07%	0.09%	
2000-2003	-0.14%	1.40%			0.17%	0.30%	
2003-2008	1.02%	0.82%			0.79%	1.17%	
2003-2013	0.87%	0.59%			0.65%	0.75%	

Historic values are shaded

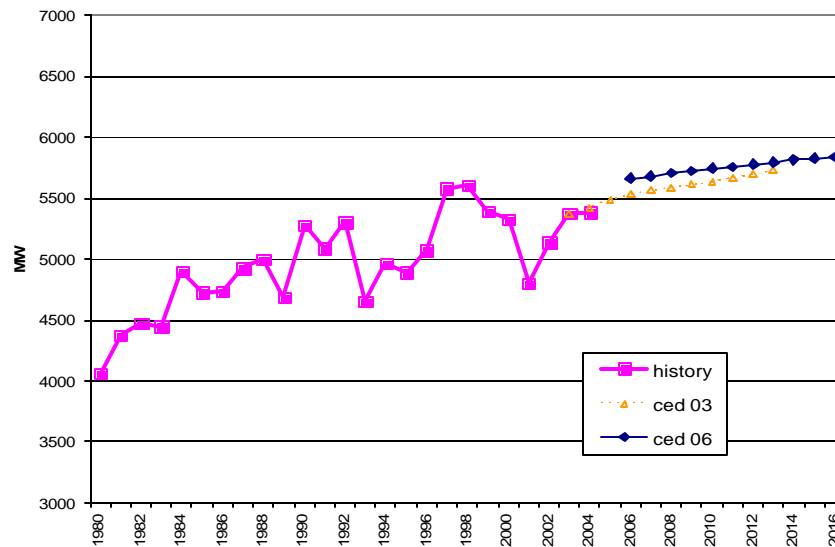
As shown in Figure 6-1, the CED 2006 electricity consumption forecast is higher in the short term than the CED 2003 forecast. This is due to actual 2003 economic and demographic growth being higher than was assumed in the CED 2003 forecast. However, the growth rate of the CED 2006 forecast is less than the CED 2003 forecast due to lower forecasted household income and population growth projections. The CED 2003 forecast projected a downturn in the Los Angeles region and followed by recovery. The actual impact of the recent recession in the Los Angeles region was very mild and hence, very little “recovery” is now projected for that region. The end result is that by the end of the forecast period both forecasts are very similar.

**Figure 6-1: LADWP Planning Area Electricity Forecast**



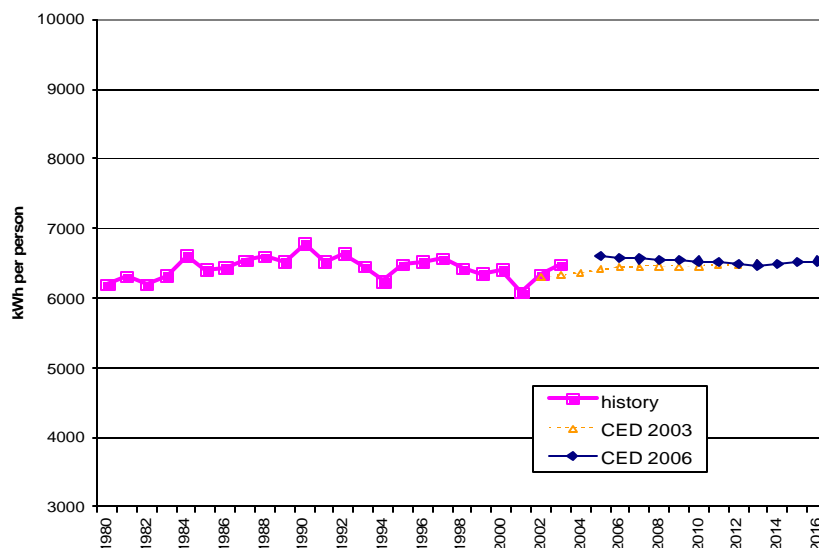
The difference in LADWP planning area peak demand forecasts, shown in Figure 6-2, is similar to that of the electricity consumption forecast. However the CED 2006 peak forecast is higher than the CED 2003 over the entire forecast period forecast. The primary reason for the increase is an increased 2004 starting point from adjusting the forecast upward to account for forecast calibration and normal weather. Since 1998, peak temperatures in the Los Angeles area have been below the 54 year median peak temperature. Adjusting the forecasted peak to account for normal weather increases the LADWP peak forecast starting point over the historic 2004 value. The differences in growth patterns of the two forecasts are similar to the differences in the underlying consumption forecasts.

**Figure 6-2: LADWP Planning Area Peak**



Figures 6-3 provides comparisons of LADWP planning area per capita electricity consumption between the CED 2006 and CED 2003 forecasts. Per capita consumption in the CED 2006 forecast is higher in the short term than that projected in the CED 2003 forecast. Per capita use is projected to decline slightly over the CED 2006 forecast period, unlike the CED 2003 forecast, which projected a slight increase. The CED 2006 forecast of per capita consumption is higher in the very near term due to higher short term household income projections. Over the long run impacts of energy efficiency standards for buildings and appliances cause reductions in per capita consumption. By the end of the forecast period there is little difference in per capita consumption between the two forecasts.

**Figure 6-3: LADWP Planning Area per Capita Electricity Consumption**



Per capita peak demand, shown in Figure 6-4, is higher by a constant amount over the entire forecast period due to the greater-than-projected rebound of peak use than was assumed in the CED 2003 forecast. Adjusting for the increase in starting points, the two projections of per capita peak demand are similar throughout the forecast period and below the pre-electricity crisis levels.

**Figure 6-4: LADWP Planning Area per Capita Peak Demand**

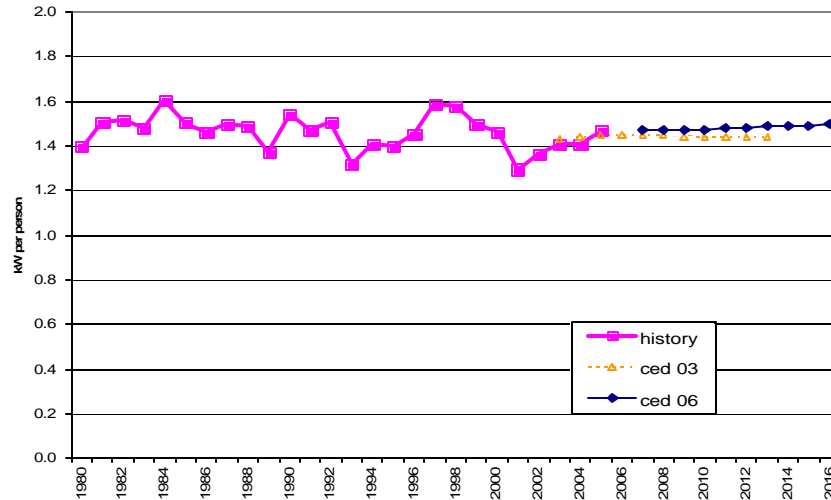
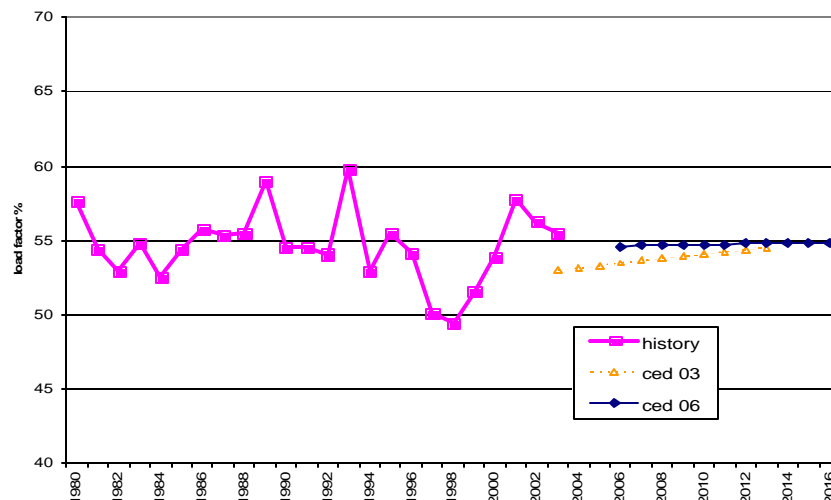


Figure 6-5 provides a comparison of the respective load factors. The load factor is a measure of the relative increase in peak demand with respect to annual electricity consumption. Lower load factors indicate more of a needle peak and higher load factors indicate a more stable load. Variation in historic load factors is caused in part by annual weather patterns. The CED 2006 projected load factor is relatively constant over the forecast period. This is in contrast to a slight increase in load factor of the CED 2003 forecast.

**Figure 6-5: LADWP Planning Area Load Factor**



## Sector Level Results and Input Assumptions

### *Residential*

Figure 6-6 provides a comparison between the CED 2006 and CED 2003 LADWP planning area residential forecasts. The CED 2006 forecast is higher in 2006 than the CED 2003 forecast due to higher starting point caused by actual 2003 economic and demographic input values being higher than were projected in the CED 2003 forecast. Projected growth in the CED 2006 forecast is lower after 2006 than in the CED 2003 forecast due to lower projected population and household income growth rates.

**Figure 6-6: LADWP Planning Area Residential Consumption**

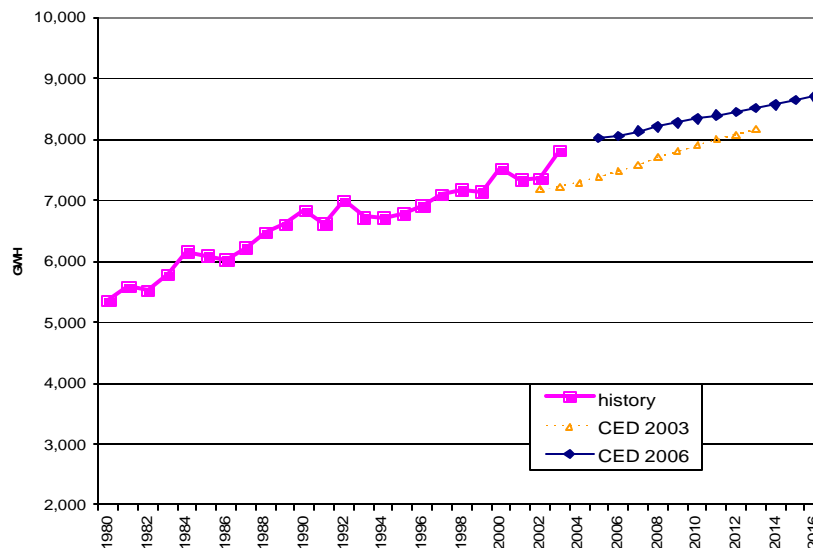
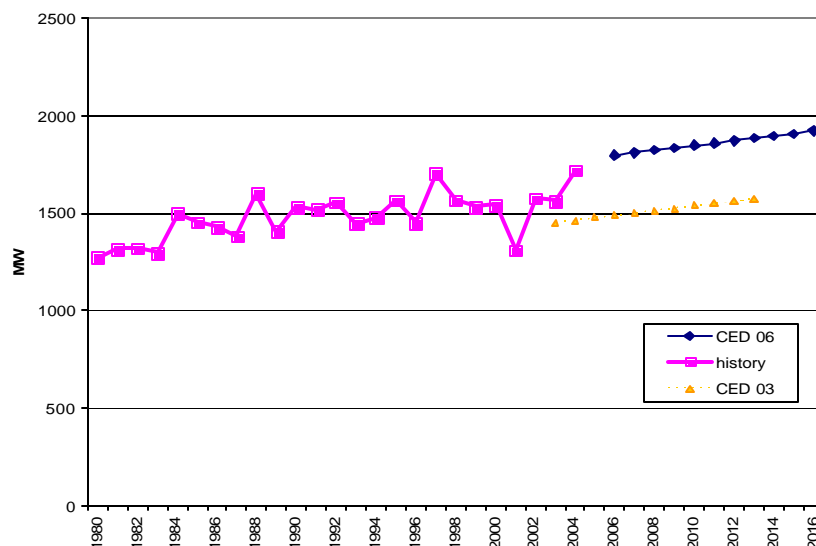


Figure 6-7 provides a comparison of the CED 2006 and CED 2003 residential peak demand forecasts. The CED 2006 residential peak forecast is higher than the CED 2003 forecast. This increase mirrors the difference in electricity consumption forecasts. Other than the difference in starting value, the growth rates of the two forecasts are very similar.

**Figure 6-7: LADWP Planning Area Residential Peak**

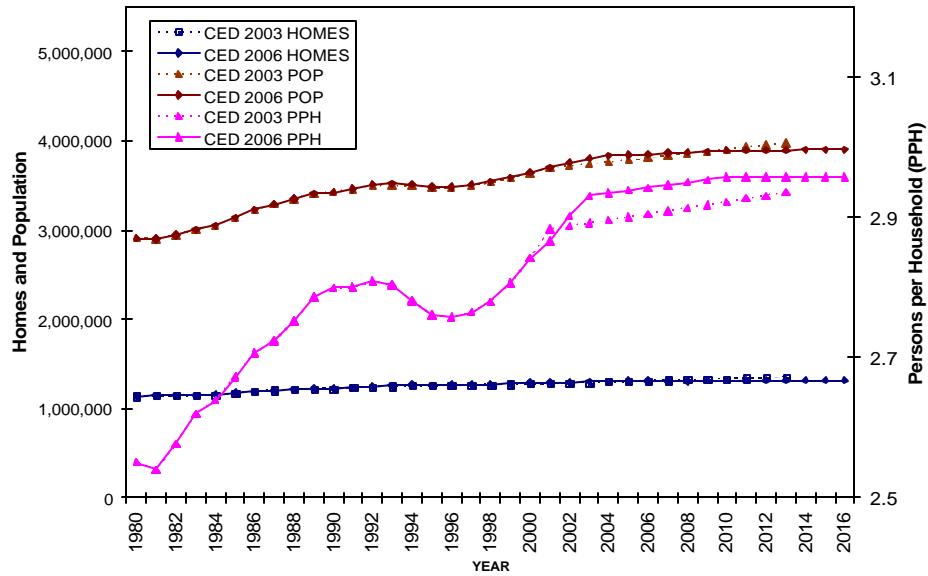


Figures 6-8 and 6-9 compare the residential drivers used in the CED 2006 forecast with those used in CED 2003. Figure 6-8 provides comparisons of total population, total households and persons per household projections. The CED 2006 forecast of total population is higher in the short term than the CED 2003 forecast due to continued high population growth seen in the LADWP planning area. The mid and long term CED 2006 growth is lower than the previous forecast after 2006 because the new DOF long-term population projections are lower than their previous forecast. Staff has also increased the projections of persons per household for the LADWP planning area based on recent higher estimates provided by the DOF E5-A reports. The rate of growth in household size, however, is less than that used in the CED 2003 forecast. Staff has reduced the previous assumptions of increasing persons per household to approximately half of the increase seen in the 1990-2000 period. The net effect of these changes is a projection of total households that is slightly lower after 2008 than the CED 2003 projection.

Figure 6-9 provides a comparison of household income between the two forecasts. Household income is derived as the product of per capita income and persons per household. The CED 2006 projection is higher in the short to mid-term projection period because of the use of regional economic forecast data. These data show that, unlike the PG&E planning area, there was no downturn in household income due to the recession and as a result the increased rebound from the recession is not included in the LADWP planning area forecast. This higher household income serves to increase the residential forecast in the short term. In the longer term the CED 2006 forecasted household income growth is lower than that used in the CED 2003 forecast.



**Figure 6-8: LADWP Planning Area Residential Demographic Projections**



**Figure 6-9: LADWP Planning Area Household Income Projections**

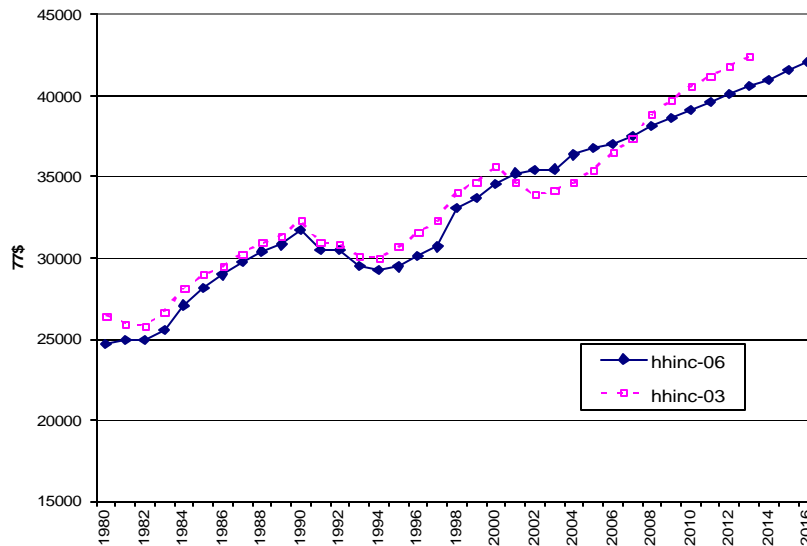
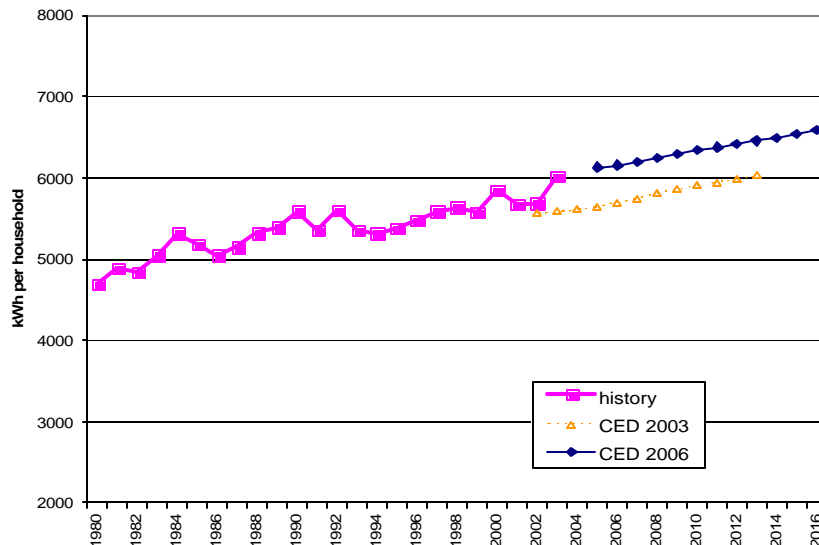


Figure 6-10 presents a comparison of use per household between the two forecasts as well as the 1980-2003 historic series. The CED 2006 forecast of use per household is higher than that projected in the CED 2003 forecast in the very near term as a result of increased short term economic and demographic estimates and a decrease in voluntary conservation efforts.

**Figure 6-10: LADWP Planning Area Use per Household**



### ***Commercial Building Sector***

Figure 6-11 provides a comparison of the commercial building sector forecasts. The CED 2006 forecast is lower throughout the entire forecast. This is primarily due to the last historic year's consumption, 2003, being lower than projected in the CED 2003 forecast. Reasons for the discrepancy in base year values for the nonresidential sectors are discussed in the uncertainty section of this chapter. The CED 2006 commercial building electricity consumption growth rate is lower than the CED 2003 forecast due to inclusion of savings from various iterations of the commercial building and appliance standards enacted from 1998 to 2005.

**Figure 6-11: LADWP Planning Area Commercial Consumption**

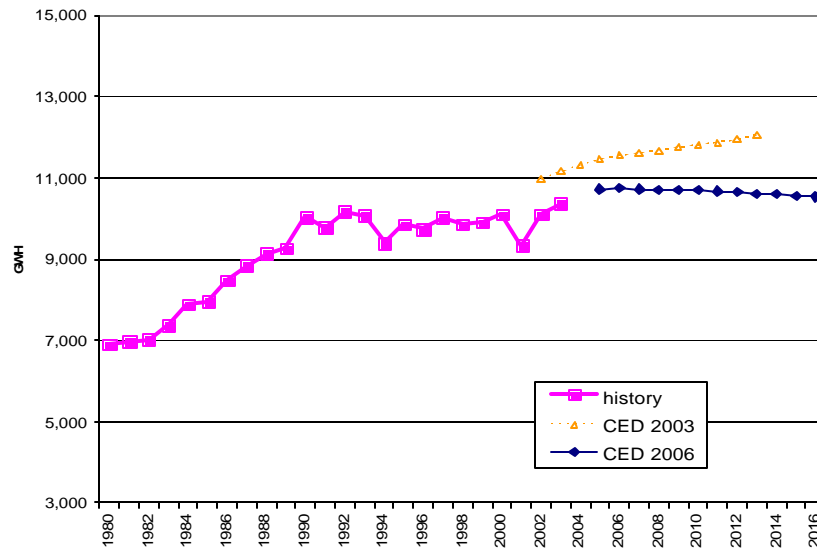
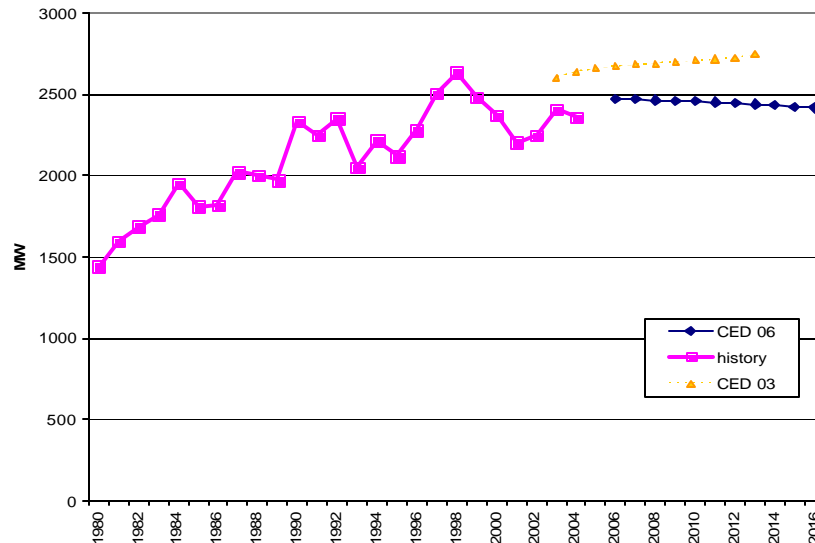


Figure 6-12 provides a comparison of the commercial peak demand forecasts. The CED 2006 forecast is lower throughout the forecast period due to a lower starting value. The difference in peak forecasts is primarily due to the difference in electricity consumption forecasts.

**Figure 6-12: LADWP Planning Area Commercial Sector Peak**



In staff's commercial building sector forecasting model, floorspace by building type (e.g. retail, offices, schools, etc) is the key driver of energy demand trends. The commercial building floorspace forecast is based on the historic trend of additions in the LADWP planning area. Figure 6-13 provides a comparison of total commercial

floorspace projections. For the LADWP planning area the CED 2006 floorspace projections are slightly higher than the CED 2003 floorspace projections.

**Figure 6-13: LADWP Planning Area Commercial Floorspace**

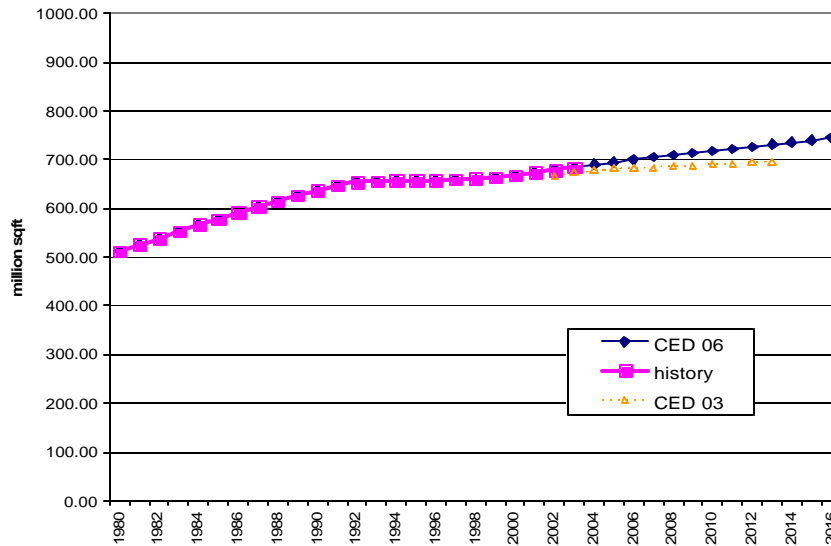
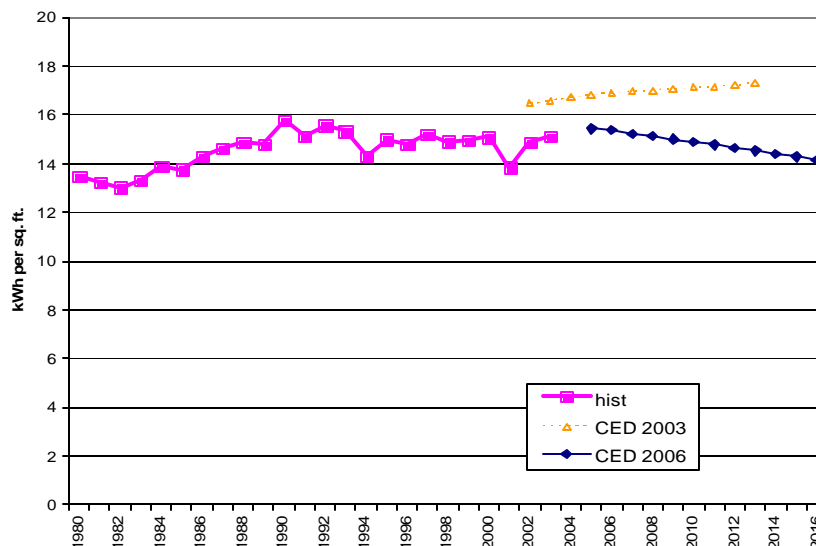


Figure 6-14 provides a comparison of kWh per square foot of the CED 2006 and CED 2003 forecasts. The use per square foot is lower over the entire period in the CED 2006 forecast. This is primarily due to a lower starting point, which is a result of lower commercial sales figures being reported since CED 2003. Consumption per square foot declines slightly over the forecast period as a result of impacts from the 1998 through 2005 iterations of the commercial building and appliance standards.

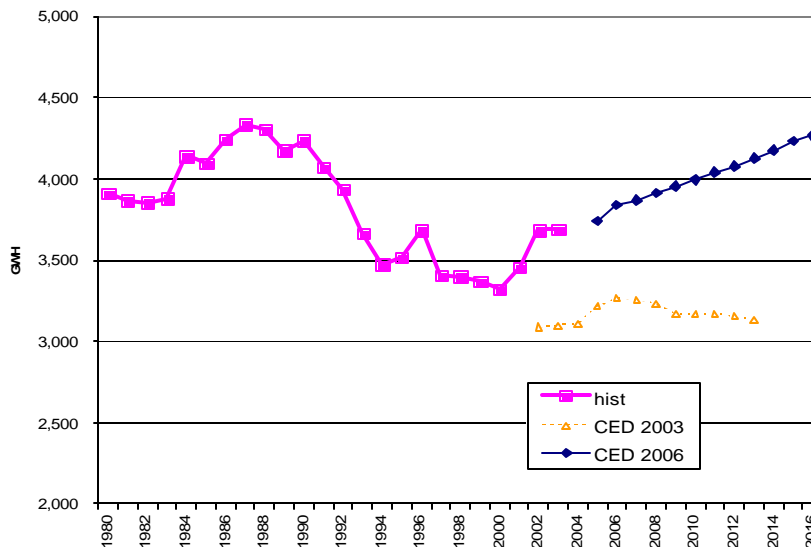
**Figure 6-14: LADWP Planning Area Commercial kWh per Square Foot**



## Industrial Sector

Figure 6-15 provides comparisons of the LADWP planning area industrial sector electricity consumption forecasts. The CED 2006 industrial electricity consumption forecast is higher throughout the entire forecast period than the CED 2003 forecast. This is primarily due to a higher starting point of the CED 2006 forecast which is a result of the recent increase in unclassified energy consumption reported by LSEs pursuant to Quarter Fuel and Energy Reporting regulations, and the method of allocation of that consumption to the various nonresidential sectors. The CED 2006 forecasted growth rate is also higher than that of the CED 2003 forecast due to stronger anticipated growth in the industrial sector in the LADWP planning area. This is consistent with what staff believes to be the recent trend in industrial growth.

**Figure 6-15: LADWP Planning Area Industrial Consumption**



**Figure 6-16** provides a comparison of the industrial sector peak forecasts. The CED 2006 peak is higher throughout the forecast period as a result of a higher starting value. This is due to use of revised industrial load shapes and sector specific calibration. As in the electricity consumption forecast, the CED 2006 projected growth rate is higher than that projected in the CED 2003 forecast.

**Figure 6-16: LADWP Planning Area Industrial Sector Peak**

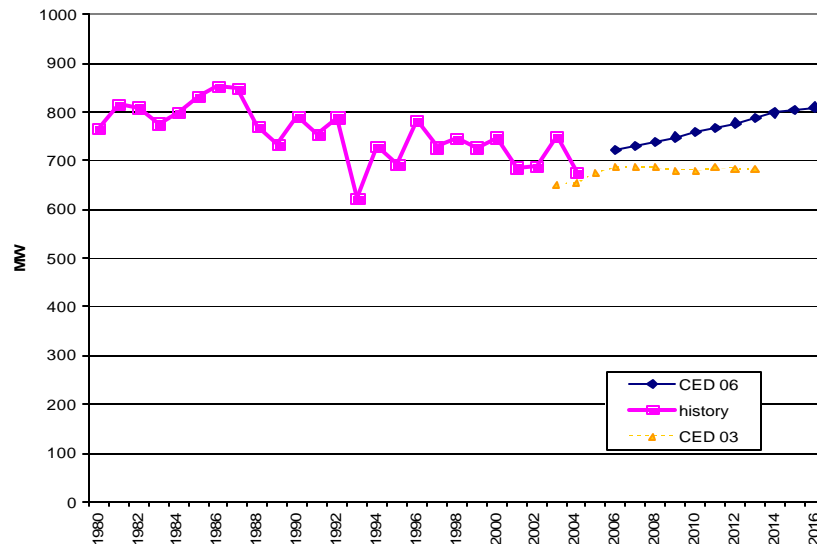
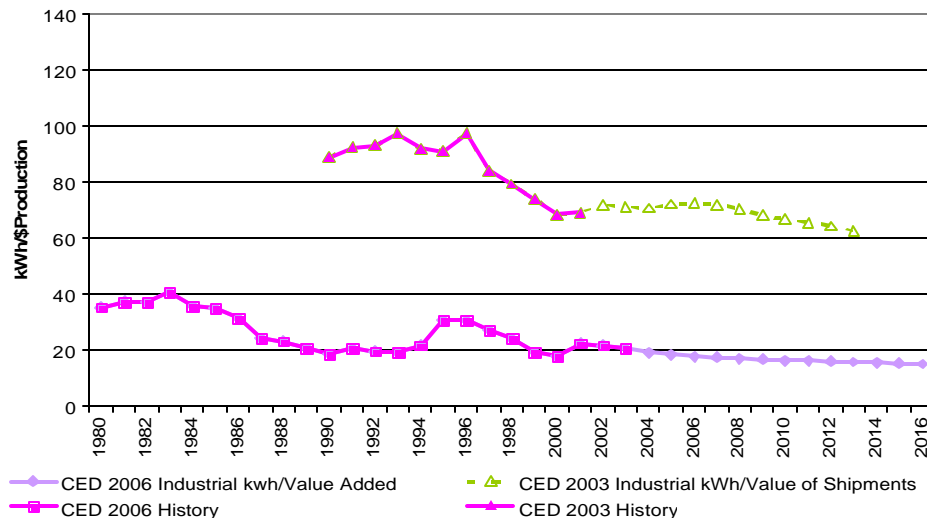


Figure 6-17 provides a comparison of use per dollar value of production between the CED 2006 and CED 2003 forecasts. The CED 2003 forecast used value of shipments provided by the UCLA Anderson School of Business. The CED 2006 forecast uses value added provided by the economy.com projections of October, 2004. Staff switched to economy.com for its economic projections because the economic drivers are provided at county and MSA levels of disaggregation. It is apparent from the historic county level economic drivers that there are major differences in economic activity in the various regions of California. This enables the CED 2006 forecast to assume different patterns of economic activity in the separate utility planning areas. The UCLA forecast is only provided at a statewide level. Translation of these statewide projections to individual regions was not considered critical during the hiatus in formal planning prior to enactment of SB 1389, and thus for the CED 2003 energy forecasts, staff prepared economic projections that grew at the same rate for all parts of the state. With the resumption of planning area-based energy assessments in this 2005 *Energy Report* cycle, staff shifted back to preparation of economic/demographic projections tailored to the various sub-regions of the state.

KWh per dollar of industrial value added in the CED 2006 industrial forecast is projected to decline slightly over the forecast period in contrast to the CED 2003 forecast which projected relatively constant values through 2008 and then a sharper decline through the end of the forecast.

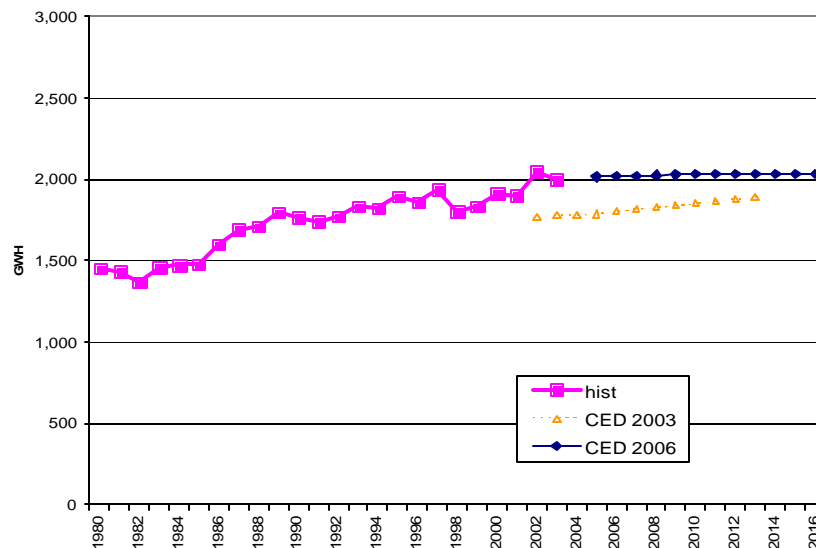
**Figure 6-17: LADWP Planning Area Industrial Use per Production Unit**



## Other Sectors

Figures 6-18 and 6-19 provide comparisons of the remaining sector electricity consumption forecasts. Figure 6-18 provides a comparison of the transportation, communication and utilities (TCU) sector forecasts. The CED 2006 TCU forecast is slightly higher than the CED 2003 forecast due to an increased historic starting point. The CED 2006 forecasted growth rate is relatively constant due to a lower population growth rate. Because of lack of accurate historic information the TCU sector was forecasted at a sector level driven by population rather than at a specific industry level as in the previous forecast. Figure 6-19 provides comparisons of the agriculture & water pumping (ag & water pumping) and mining & oil extraction sector forecasts. The CED 2006 ag & water pumping forecast is similar to the CED 2003 forecast. The CED 2006 mining & oil extraction is lower due to a lower historic starting point.

**Figure 6-18: LADWP Planning Area Transportation, Communication and Utilities Sector Electricity Consumption**



**Figure 6-19: LADWP Planning Area Agriculture & Water Pumping and Mining & Oil Extraction Electricity Consumption Forecasts**

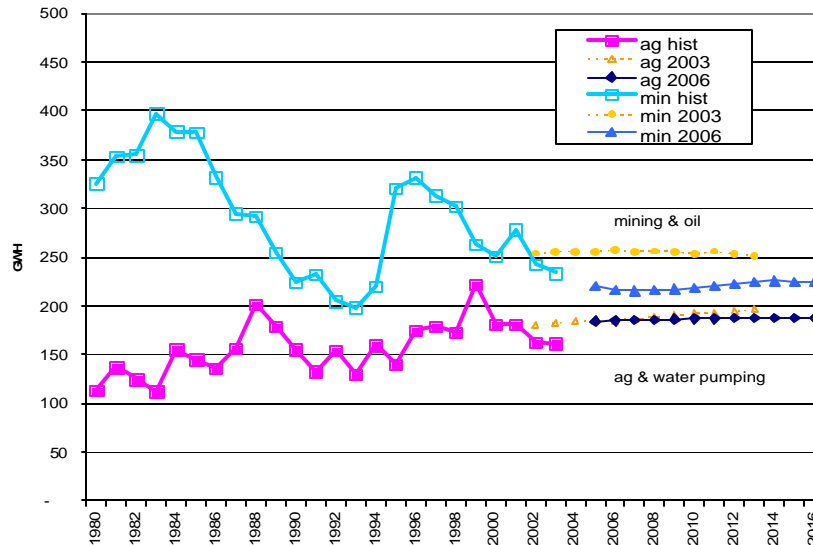
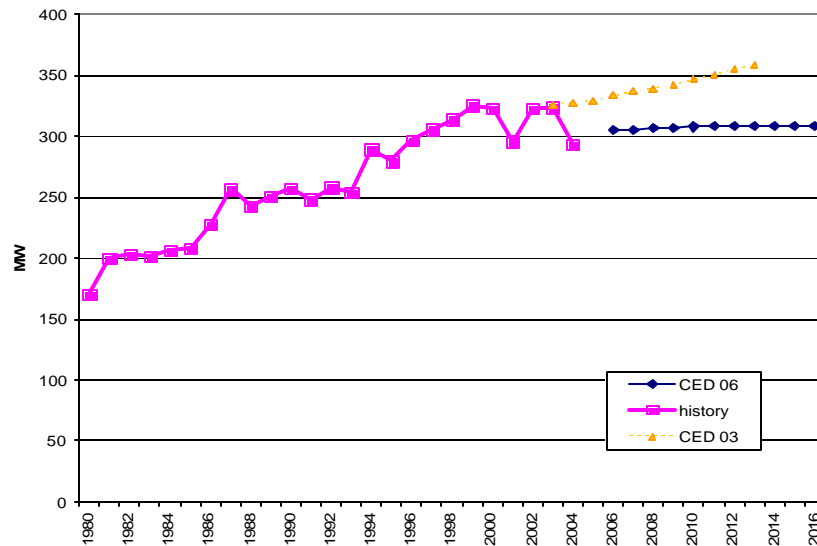




Figure 6-20 provides a comparison of the combined Other Sector peaks for the CED 2006 and CED 2003 forecasts. The CED 2006 forecast starts at a lower historic point and remains relatively constant over the forecast. This is consistent with the underlying electricity consumption forecasts.

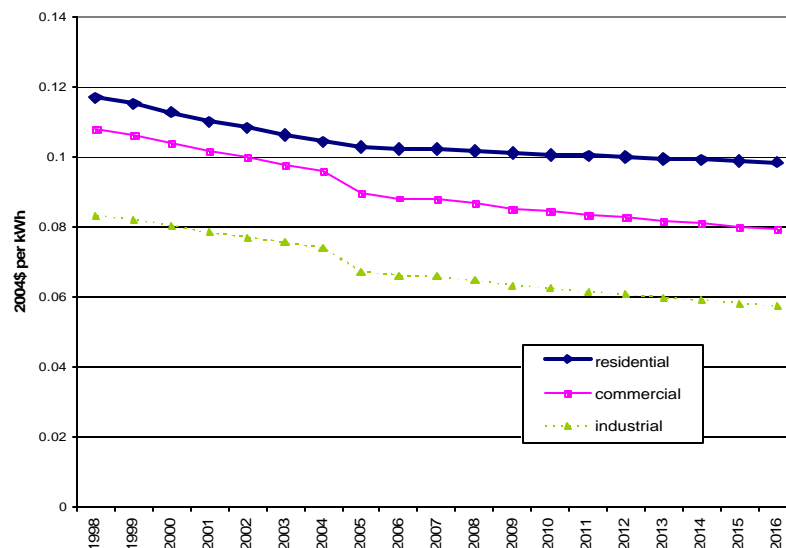
**Figure 6-20: LADWP Planning Area Other Sector Peak**



## Electricity Prices

Figure 6-21 shows the sector prices used in the CED 2006 forecast for the LADWP planning area. These electricity prices are based on information provided by LADWP.<sup>1</sup>

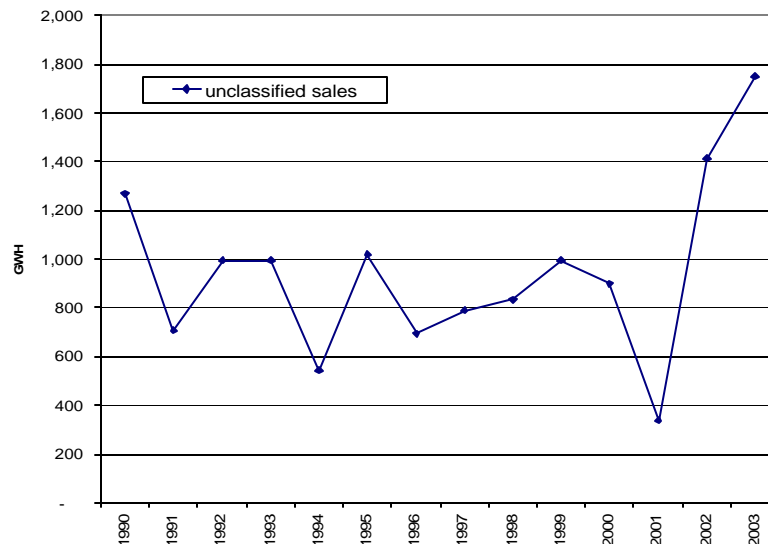
**Figure 6-21: LADWP Planning Area Prices Used in Forecast**



## Uncertainty Introduced by Historic Data Inaccuracy

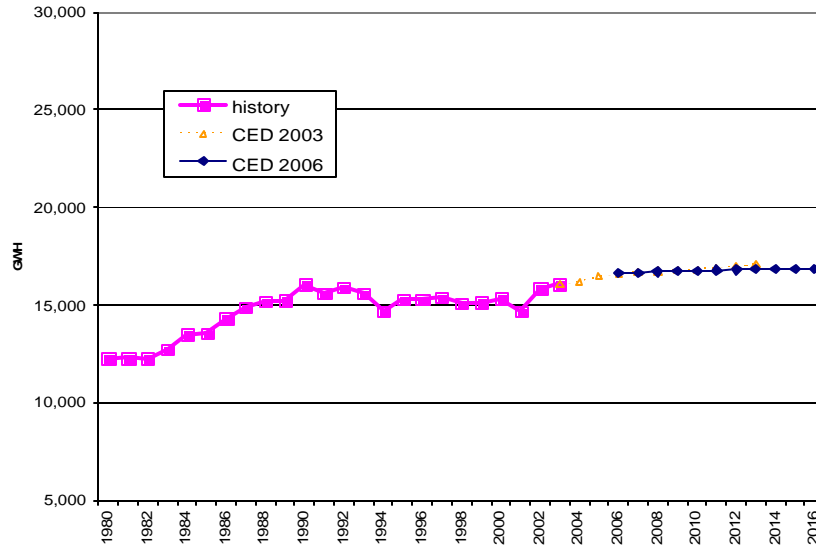
Figure 6-22 provides the recent historic values of unclassified electricity in the LADWP planning area. Recent history contains a large amount of electricity consumption which has not been classified by LSEs according to the QFER reporting requirements. In the absence of additional knowledge, this electricity consumption is allocated to the industrial, commercial and TCU sectors proportional to classified sales. If the actual sector distribution of unclassified electricity use is different than the distribution of properly classified electricity, the forecast will be negatively impacted. Since commercial and industrial customers have different load shapes misclassifying these customers could result in erroneous estimation of sector consumption, peak demand and growth rates.

**Figure 6-22: LADWP Planning Area Historic Unclassified Consumption**



To illustrate the implications of this problem of unclassified consumption data, **Figure 6-23** provides a comparison of the CED 2006 and CED 2003 forecasts at a more aggregate level of total nonresidential consumption. This shows that there is virtually no difference in aggregate forecasts at the nonresidential level. However, in order to effectively implement efficiency and demand response programs it is important to know how nonresidential energy is used at a more disaggregate level. Staff has yet to find a solution to this apparent reporting problem. It is necessary that accurate consumption information be provided the Energy Commission if staff is to understand how energy is being used.

**Figure 6-23: LADWP Planning Area Nonresidential Electricity  
(Commercial, Industrial, TCU and Streetlighting)**



<sup>1</sup> All LSEs >200MW peak demand were required to provide electricity price projections by customer sector pursuant to GENERAL INSTRUCTIONS: RETAIL ELECTRICITY PRICE FORECAST ELECTRICITY DATA REQUEST 2003-2016 adopted by Commissioner order, November 3, 2004.

**Form 1.1 - LADWP**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Electricity Consumption by Sector (GWh)**

Year	Residential	Commercial	Industrial	Mining	Agricultural	TCU	Streetlighting	Total Consumption
1980	5,357	6,894	3,914	326	113	1,113	343	18,059
1981	5,587	6,979	3,869	354	137	1,083	350	18,359
1982	5,529	7,032	3,855	355	125	1,023	346	18,265
1983	5,794	7,383	3,881	397	112	1,119	343	19,029
1984	6,157	7,886	4,142	379	156	1,146	328	20,195
1985	6,092	7,960	4,096	379	145	1,172	309	20,152
1986	6,033	8,475	4,245	332	137	1,298	303	20,822
1987	6,222	8,850	4,337	295	157	1,395	297	21,552
1988	6,482	9,151	4,304	292	202	1,415	297	22,143
1989	6,601	9,268	4,175	255	180	1,505	292	22,276
1990	6,835	10,042	4,237	224	156	1,479	290	23,263
1991	6,620	9,791	4,075	232	133	1,452	292	22,595
1992	7,000	10,183	3,934	205	155	1,487	290	23,253
1993	6,726	10,080	3,663	199	130	1,548	289	22,635
1994	6,723	9,405	3,473	220	160	1,535	289	21,805
1995	6,788	9,862	3,517	321	140	1,607	290	22,526
1996	6,917	9,744	3,686	332	175	1,569	292	22,715
1997	7,106	10,035	3,409	313	179	1,643	296	22,980
1998	7,183	9,857	3,399	302	173	1,509	296	22,719
1999	7,140	9,922	3,371	263	223	1,549	284	22,751
2000	7,519	10,105	3,324	252	181	1,631	284	23,296
2001	7,339	9,334	3,456	278	181	1,603	298	22,489
2002	7,370	10,115	3,686	242	163	1,763	287	23,626
2003	7,818	10,379	3,690	234	162	1,697	305	24,285
2006	8,065	10,747	3,870	216	185	1,716	303	25,102
2007	8,130	10,724	3,910	215	185	1,721	302	25,187
2008	8,202	10,712	3,955	216	186	1,725	301	25,296
2009	8,270	10,706	3,994	217	186	1,729	300	25,403
2010	8,337	10,689	4,042	219	187	1,734	298	25,505
2011	8,395	10,669	4,080	220	187	1,735	297	25,582
2012	8,455	10,646	4,127	222	187	1,736	296	25,669
2013	8,512	10,620	4,177	224	187	1,737	295	25,752
2014	8,568	10,595	4,232	226	188	1,738	293	25,840
2015	8,636	10,565	4,266	225	188	1,738	292	25,910
2016	8,701	10,533	4,293	225	188	1,739	291	25,969

**Annual Growth Rates (%)**

1980-1990	2.5	3.8	0.8	-3.7	3.2	2.9	-1.7	2.6
1990-2000	1.0	0.1	-2.4	1.2	1.5	1.0	-0.2	0.0
2000-2003	1.3	0.9	3.5	-2.4	-3.7	1.3	2.4	1.4
2003-2008	1.0	0.6	1.4	-1.6	2.8	0.3	-0.3	0.8
2008-2016	0.7	-0.2	1.0	0.5	0.2	0.1	-0.4	0.3
2003-2016	0.8	0.1	1.2	-0.3	1.2	0.2	-0.4	0.5

**Form 1.1b - LADWP**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Electricity Sales by Sector (GWh)**

Year	Residential	Commercial	Industrial	Mining	Agricultural	TCU	Streetlighting	Total Consumption
1980	5,357	6,894	3,914	326	113	1,113	343	18,059
1981	5,587	6,979	3,869	354	137	1,083	350	18,359
1982	5,529	7,032	3,855	355	125	1,023	346	18,265
1983	5,794	7,383	3,651	397	112	1,119	343	18,799
1984	6,157	7,886	3,803	379	156	1,146	328	19,856
1985	6,092	7,960	3,779	379	145	1,172	309	19,835
1986	6,033	8,475	3,863	332	137	1,257	303	20,399
1987	6,222	8,839	3,956	295	157	1,299	297	21,065
1988	6,482	9,132	3,735	292	202	1,282	297	21,423
1989	6,601	9,243	3,435	255	180	1,357	292	21,363
1990	6,835	10,008	3,426	224	156	1,306	290	22,244
1991	6,620	9,739	3,128	232	133	1,273	292	21,417
1992	7,000	10,122	3,050	205	155	1,323	290	22,145
1993	6,726	10,018	2,757	199	130	1,380	289	21,498
1994	6,723	9,133	2,434	220	160	1,349	289	20,308
1995	6,788	9,552	2,454	321	140	1,394	290	20,939
1996	6,917	9,484	2,546	332	175	1,481	292	21,228
1997	7,106	9,751	2,412	313	179	1,549	296	21,605
1998	7,183	9,573	2,405	302	173	1,480	296	21,412
1999	7,140	9,640	2,345	263	223	1,540	284	21,434
2000	7,519	9,829	2,456	252	181	1,625	284	22,146
2001	7,339	9,108	2,596	278	181	1,603	298	21,404
2002	7,370	9,875	2,638	242	163	1,716	287	22,290
2003	7,818	10,124	2,704	234	162	1,697	305	23,044
2006	8,065	10,491	2,884	216	185	1,716	303	23,860
2007	8,130	10,469	2,924	215	185	1,721	302	23,945
2008	8,202	10,456	2,969	216	186	1,725	301	24,055
2009	8,270	10,450	3,009	217	186	1,729	300	24,161
2010	8,337	10,433	3,056	219	187	1,734	298	24,263
2011	8,395	10,413	3,094	220	187	1,735	297	24,341
2012	8,455	10,391	3,142	222	187	1,736	296	24,428
2013	8,512	10,365	3,191	224	187	1,737	295	24,511
2014	8,568	10,339	3,247	226	188	1,738	293	24,598
2015	8,636	10,309	3,280	225	188	1,738	292	24,669
2016	8,701	10,278	3,307	225	188	1,739	291	24,728

**Annual Growth Rates (%)**

1980-1990	2.5	3.8	-1.3	-3.7	3.2	1.6	-1.7	2.1
1990-2000	1.0	-0.2	-3.3	1.2	1.5	2.2	-0.2	0.0
2000-2003	1.3	1.0	3.3	-2.4	-3.7	1.4	2.4	1.3
2003-2008	1.0	0.6	1.9	-1.6	2.8	0.3	-0.3	0.9
2008-2016	0.7	-0.2	1.4	0.5	0.2	0.1	-0.4	0.3
2003-2016	0.8	0.1	1.6	-0.3	1.2	0.2	-0.4	0.5

**Form 1.2 - LADWP**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Net Energy for Load (GWh)**

Year	Total Consumption	Net Losses	Gross Generation	Private Supply	Net Energy for Load
1980	18,059	2,438	20,497	0	20,497
1981	18,359	2,479	20,838	0	20,838
1982	18,265	2,466	20,731	0	20,731
1983	19,029	2,538	21,567	230	21,337
1984	20,195	2,681	22,876	339	22,536
1985	20,152	2,678	22,830	317	22,513
1986	20,822	2,754	23,576	423	23,153
1987	21,552	2,844	24,396	488	23,908
1988	22,143	2,892	25,035	720	24,315
1989	22,276	2,884	25,160	913	24,247
1990	23,263	3,003	26,266	1,018	25,247
1991	22,595	2,891	25,487	1,178	24,308
1992	23,253	2,990	26,242	1,107	25,135
1993	22,635	2,902	25,538	1,137	24,400
1994	21,805	2,742	24,547	1,497	23,050
1995	22,526	2,827	25,352	1,587	23,765
1996	22,715	2,866	25,581	1,488	24,093
1997	22,980	2,917	25,897	1,375	24,522
1998	22,719	2,891	25,610	1,308	24,302
1999	22,751	2,894	25,645	1,317	24,328
2000	23,296	2,990	26,286	1,150	25,136
2001	22,489	2,890	25,378	1,085	24,293
2002	23,626	3,009	26,635	1,335	25,300
2003	24,285	3,111	27,396	1,241	26,155
2006	25,102	3,221	28,323	1,241	27,082
2007	25,187	3,233	28,420	1,241	27,178
2008	25,296	3,247	28,544	1,241	27,302
2009	25,403	3,262	28,664	1,241	27,423
2010	25,505	3,276	28,780	1,241	27,539
2011	25,582	3,286	28,868	1,241	27,627
2012	25,669	3,298	28,967	1,241	27,726
2013	25,752	3,309	29,061	1,241	27,820
2014	25,840	3,321	29,161	1,241	27,919
2015	25,910	3,330	29,241	1,241	27,999
2016	25,969	3,338	29,308	1,241	28,066

**Annual Growth Rates (%)**

1980-1990	2.6	2.1	2.5	#DIV/0!	2.1
1990-2000	0.0	0.0	0.0	1.2	0.0
2000-2003	1.4	1.3	1.4	2.6	1.3
2003-2008	0.8	0.9	0.8	0.0	0.9
2008-2016	0.3	0.3	0.3	0.0	0.3
2003-2016	0.5	0.5	0.5	0.0	0.5

**Form 1.3 - LADWP**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Coincident Peak Demand by Sector (MW)**

Year	Residential		Commercial		Industrial			Total Industrial	Agr.	TCU & Street-lighting	Total
	Base Load	Weather Sensitive	Base Load	Weather Sensitive	Process	Assembly	Mining				
1990	1,156	377	1,438	901	257	484	50	791	13	244	4,920
1991	1,092	427	1,424	826	248	455	51	754	11	237	4,771
1992	1,112	447	1,421	930	260	486	43	789	12	246	4,957
1993	985	464	1,316	736	222	360	40	622	10	244	4,378
1994	1,081	398	1,418	801	257	426	46	729	11	278	4,716
1995	998	571	1,340	783	220	413	61	693	10	270	4,665
1996	1,086	366	1,483	800	282	432	69	783	13	284	4,814
1997	1,082	623	1,474	1,036	235	429	63	728	13	292	5,248
1998	1,262	304	1,646	988	261	410	73	745	16	297	5,259
1999	1,283	250	1,651	831	259	402	66	727	21	304	5,067
2000	1,231	312	1,521	851	253	440	55	748	15	309	4,986
2001	1,177	134	1,527	681	237	389	60	686	15	281	4,501
2002	1,198	382	1,528	724	238	398	52	688	13	310	4,843
2003	1,235	329	1,551	857	250	450	50	750	12	311	5,045
2004	1,121	600	1,406	956	229	406	42	677	13	280	5,052
2006	1,175	623	1,476	1,000	244	435	43	722	13	291	5,301
2007	1,185	625	1,473	997	245	442	43	730	13	292	5,315
2008	1,196	627	1,471	995	246	450	43	739	13	293	5,335
2009	1,207	630	1,471	993	247	458	44	748	13	294	5,356
2010	1,217	633	1,468	990	249	465	44	758	13	294	5,374
2011	1,226	635	1,466	987	249	472	45	767	14	294	5,388
2012	1,235	637	1,463	984	251	480	45	777	14	295	5,404
2013	1,244	640	1,460	981	253	488	46	787	14	295	5,420
2014	1,252	644	1,457	978	256	496	47	798	14	295	5,436
2015	1,262	647	1,453	974	257	501	47	804	14	295	5,449
2016	1,272	652	1,449	970	258	505	47	810	14	295	5,461

**Annual Growth Rates (%)**

1980-1990	4.4	-3.2	5.2	4.6	1.0	0.3	-2.0	0.3	5.4	4.1	3.0
1990-2000	0.6	-1.9	0.6	-0.6	-0.2	-0.9	1.0	-0.5	1.0	2.4	0.1
2000-2001	-4.4	-57.0	0.4	-20.0	-6.4	-11.6	8.7	-8.4	1.3	-8.9	-9.7
2000-2003	0.1	1.8	0.7	0.2	-0.4	0.7	-3.6	0.1	-5.2	0.3	0.4
2003-2008	-0.6	13.8	-1.1	3.0	-0.3	0.0	-2.6	-0.3	1.6	-1.2	1.1
2008-2016	0.8	0.5	-0.2	-0.3	0.6	1.4	0.9	1.1	0.2	0.1	0.3
2003-2016	0.2	5.4	-0.5	1.0	0.2	0.9	-0.5	0.6	0.7	-0.4	0.6

**Form 1.4 - LADWP**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Peak Demand (MW)**

Year	Total End Use Load	Net Losses	Gross Generation	Private Supply	Net Peak Demand	Load Factor (%)
1980	3,653	409	4,062	0	4,062	57.6
1981	3,933	440	4,373	0	4,373	54.4
1982	4,024	451	4,475	0	4,475	52.9
1983	4,037	448	4,485	39	4,446	54.8
1984	4,460	493	4,953	57	4,896	52.5
1985	4,304	476	4,780	53	4,727	54.4
1986	4,329	477	4,806	71	4,735	55.8
1987	4,512	496	5,008	82	4,926	55.4
1988	4,619	504	5,123	121	5,002	55.5
1989	4,369	472	4,841	153	4,688	59.0
1990	4,920	532	5,452	171	5,281	54.6
1991	4,771	512	5,283	198	5,085	54.6
1992	4,957	534	5,491	186	5,305	54.1
1993	4,378	469	4,847	191	4,656	59.8
1994	4,716	500	5,216	251	4,965	53.0
1995	4,665	493	5,158	266	4,891	55.5
1996	4,814	511	5,325	250	5,075	54.2
1997	5,248	562	5,810	231	5,579	50.2
1998	5,259	564	5,823	220	5,604	49.5
1999	5,067	543	5,610	221	5,389	51.5
2000	4,986	537	5,523	193	5,330	53.8
2001	4,501	484	4,985	182	4,803	57.7
2002	4,843	517	5,360	224	5,136	56.2
2003	5,045	542	5,587	208	5,378	55.5
2004	5,052	543	5,595	208	5,386	56.5
2006	5,301	570	5,872	208	5,663	54.6
2007	5,315	572	5,887	208	5,679	54.6
2008	5,335	574	5,909	208	5,701	54.7
2009	5,356	576	5,932	208	5,724	54.7
2010	5,374	579	5,953	208	5,744	54.7
2011	5,388	580	5,968	208	5,760	54.8
2012	5,404	582	5,986	208	5,778	54.8
2013	5,420	584	6,004	208	5,795	54.8
2014	5,436	586	6,022	208	5,813	54.8
2015	5,449	587	6,036	208	5,828	54.8
2016	5,461	588	6,049	208	5,841	54.9

**Annual Growth Rates (%)**

1990-2000	0.1	0.1	0.1	1.2	0.1
2000-2001	-9.7	-9.9	-9.7	-5.7	-9.9
2000-2003	0.4	0.3	0.4	2.6	0.3
2003-2008	1.1	1.2	1.1	0.0	1.2
2008-2016	0.3	0.3	0.3	0.0	0.3
2003-2016	0.6	0.6	0.6	0.0	0.6



**Form 1.5 - LADWP**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Noncoincident Peak Demand Temperature Scenarios**

Year	1-in-2 Temperatures	1-in-5 Temperatures	1-in-10 Temperatures	1-in-20 Temperatures	1-in-5 Multiplier	1-in-10 Multiplier	1-in-20 Multiplier
2006	5,663	5,984	6,044	6,057	1.057	1.067	1.069
2007	5,679	6,001	6,061	6,073	1.057	1.067	1.069
2008	5,701	6,024	6,084	6,097	1.057	1.067	1.069
2009	5,724	6,048	6,109	6,121	1.057	1.067	1.069
2010	5,744	6,070	6,131	6,143	1.057	1.067	1.069
2011	5,760	6,086	6,147	6,160	1.057	1.067	1.069
2012	5,778	6,105	6,166	6,179	1.057	1.067	1.069
2013	5,795	6,124	6,185	6,198	1.057	1.067	1.069
2014	5,813	6,143	6,205	6,217	1.057	1.067	1.069
2015	5,828	6,158	6,220	6,232	1.057	1.067	1.069
2016	5,841	6,172	6,234	6,246	1.057	1.067	1.069

**Form 1.7a - LADWP**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Private Supply by Sector (GWh)**

Year	Residential	Commercial	Industrial	Mining	Agricultural	TCU	Streetlighting	Total Consumption
1980	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0
1983	0	0	230	0	0	0	0	230
1984	0	0	339	0	0	0	0	339
1985	0	0	317	0	0	0	0	317
1986	0	0	382	0	0	41	0	423
1987	0	11	381	0	0	96	0	488
1988	0	19	569	0	0	132	0	720
1989	0	25	740	0	0	147	0	913
1990	0	34	811	0	0	173	0	1,018
1991	0	52	947	0	0	179	0	1,178
1992	0	61	883	0	0	163	0	1,107
1993	0	63	906	0	0	168	0	1,137
1994	0	272	1,039	0	0	186	0	1,497
1995	0	311	1,063	0	0	214	0	1,587
1996	0	259	1,140	0	0	88	0	1,488
1997	0	284	997	0	0	94	0	1,375
1998	0	284	994	0	0	29	0	1,308
1999	0	282	1,026	0	0	9	0	1,317
2000	0	276	868	0	0	5	0	1,150
2001	0	226	860	0	0	0	0	1,085
2002	0	240	1,048	0	0	47	0	1,335
2003	0	256	986	0	0	0	0	1,241
2006	0	256	986	0	0	0	0	1,241
2007	0	256	986	0	0	0	0	1,241
2008	0	256	986	0	0	0	0	1,241
2009	0	256	986	0	0	0	0	1,241
2010	0	256	986	0	0	0	0	1,241
2011	0	256	986	0	0	0	0	1,241
2012	0	256	986	0	0	0	0	1,241
2013	0	256	986	0	0	0	0	1,241
2014	0	256	986	0	0	0	0	1,241
2015	0	256	986	0	0	0	0	1,241
2016	0	256	986	0	0	0	0	1,241

**Annual Growth Rates (%)**

1980-1990			
1990-2000	23.2	0.7	1.2
2000-2003	-2.6	4.3	2.6
2003-2008	0.0	0.0	0.0
2008-2016	0.0	0.0	0.0
2003-2016	0.0	0.0	0.0

**Form 2.2 - LADWP**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Planning Area Economic and Demographic Assumptions**

Year	Population	Households	Persons per Household	Per Capita Income (2003\$)	Industrial Value Added (Millions 2003\$)
1980	2,911,071	1,141,348	2.551	24,003	9,253
1981	2,906,382	1,144,334	2.540	24,373	9,511
1982	2,946,765	1,143,395	2.577	23,985	9,639
1983	3,008,025	1,147,822	2.621	24,172	9,812
1984	3,055,023	1,157,502	2.639	25,451	10,622
1985	3,144,360	1,176,354	2.673	26,120	10,847
1986	3,233,979	1,194,701	2.707	26,539	10,683
1987	3,290,068	1,207,674	2.724	27,083	12,171
1988	3,350,446	1,217,310	2.752	27,410	12,662
1989	3,410,676	1,223,827	2.787	27,430	12,412
1990	3,426,296	1,223,775	2.800	28,117	12,072
1991	3,463,569	1,236,693	2.801	26,973	11,274
1992	3,511,438	1,249,823	2.810	26,948	10,496
1993	3,521,592	1,255,453	2.805	26,113	10,459
1994	3,515,761	1,263,828	2.782	26,074	10,132
1995	3,483,673	1,261,648	2.761	26,464	10,533
1996	3,483,861	1,263,289	2.758	27,057	10,896
1997	3,513,029	1,270,599	2.765	27,520	11,562
1998	3,542,204	1,273,970	2.780	29,499	12,544
1999	3,591,746	1,279,983	2.806	29,801	13,626
2000	3,652,839	1,285,464	2.842	30,182	14,216
2001	3,703,458	1,292,013	2.866	30,483	12,413
2002	3,759,490	1,295,317	2.902	30,249	11,223
2003	3,809,972	1,299,743	2.931	30,020	11,288
2004	3,833,441	1,306,076	2.935	30,718	11,656
2005	3,843,425	1,307,936	2.939	31,033	12,019
2006	3,853,299	1,309,492	2.943	31,207	12,253
2007	3,863,057	1,311,131	2.946	31,594	12,522
2008	3,872,701	1,312,726	2.950	32,056	12,840
2009	3,882,228	1,314,276	2.954	32,465	13,130
2010	3,891,648	1,315,783	2.958	32,837	13,421
2011	3,893,986	1,316,573	2.958	33,246	13,697
2012	3,896,265	1,317,343	2.958	33,658	13,987
2013	3,898,476	1,318,090	2.958	34,033	14,284
2014	3,900,628	1,318,817	2.958	34,388	14,575
2015	3,902,718	1,319,523	2.958	34,854	14,798
2016	3,904,746	1,320,208	2.958	35,289	15,006

**Annual Growth Rates (%)**

1990-2000	0.6	0.5	0.1	0.7	1.6
2000-2001	1.4	0.5	0.9	1.0	-12.7
2000-2003	1.4	0.4	1.0	-0.2	-7.4
2003-2008	0.3	0.2	0.1	1.3	2.6
2008-2016	0.1	0.1	0.0	1.2	2.0
2003-2016	0.2	0.1	0.1	1.3	2.2

**Form 2.3a - LADWP**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Electricity Rate Forecast (2003 cents/kwh)**

Year	GDP Implicit Price Deflator	Residential	Small Commercial	Medium Commercial	Industrial
1990	75.49	11.78	11.35	11.35	9.24
1991	78.13	11.49	10.46	10.46	9.07
1992	79.92	11.50	10.76	10.76	9.48
1993	81.77	12.05	10.94	10.94	10.14
1994	83.51	11.94	11.66	11.66	9.64
1995	85.22	11.54	10.65	10.65	9.38
1996	86.83	11.32	10.44	10.44	9.24
1997	88.28	11.82	10.55	10.55	8.42
1998	89.26	11.69	12.15	10.74	8.33
1999	90.54	11.52	11.97	10.59	8.21
2000	92.52	11.28	11.72	10.36	8.04
2001	94.74	11.01	11.44	10.12	7.85
2002	96.31	10.84	11.26	9.94	7.71
2003	98.07	10.64	11.06	9.74	7.55
2004	100.00	10.44	9.60	9.60	7.41
2005	101.51	10.29	8.95	8.95	6.74
2006	103.64	10.23	8.82	8.82	6.62
2007	105.58	10.22	8.78	8.78	6.58
2008	107.36	10.17	8.68	8.68	6.47
2009	109.26	10.11	8.54	8.54	6.33
2010	111.24	10.07	8.44	8.44	6.24
2011	113.25	10.03	8.35	8.35	6.15
2012	115.23	10.00	8.26	8.26	6.07
2013	117.23	9.96	8.18	8.18	5.98
2014	119.25	9.92	8.09	8.09	5.90
2015	121.31	9.89	8.01	8.01	5.82
2016	123.42	9.85	7.93	7.93	5.74

**Annual Growth Rates (%)**

1990-2000	2.1	-0.4	0.3	-0.9	-1.4
2000-2001	2.4	-2.3	-2.3	-2.3	-2.3
2000-2003	2.0	-1.9	-1.9	-2.1	-2.0
2003-2008	1.8	-0.9	-4.7	-2.3	-3.0
2008-2016	1.8	-0.4	-1.1	-1.1	-1.5
2003-2016	1.8	-0.6	-2.5	-1.6	-2.1

# CHAPTER 7

## BURBANK, GLENDALE AND PASADENA (BGP) PLANNING AREA

The Burbank, Glendale and Pasadena planning area consists of the municipal utilities serving the cities of Burbank, Glendale and Pasadena. Staff has traditionally forecast these cities together. In the future, forecasts for the individual cities will be included in their respective control areas.

This chapter is organized in a fashion similar to those for the other planning areas. First, forecasted total and per capita consumption and peak loads for the planning area are presented and compared to those in the CED 2003 forecast. The forecasted load factor, jointly determined by the consumption and peak load estimates, is also discussed. Then, sector consumption and peak load forecasts are presented; the residential, commercial, industrial and “other” sector forecasts are compared to those in CED 2003. Electricity prices used as inputs to the forecast are then presented. Finally, problems posed for the forecast by the potential inaccuracy of historical data are briefly discussed.

### Forecast Results

Table 7-1 presents a comparison of electricity consumption and peak demand for selected years showing how staff’s CED 2006 forecast differs from its CED 2003 forecast.

**Table 7-1: BGP Planning Area Forecast Comparison**

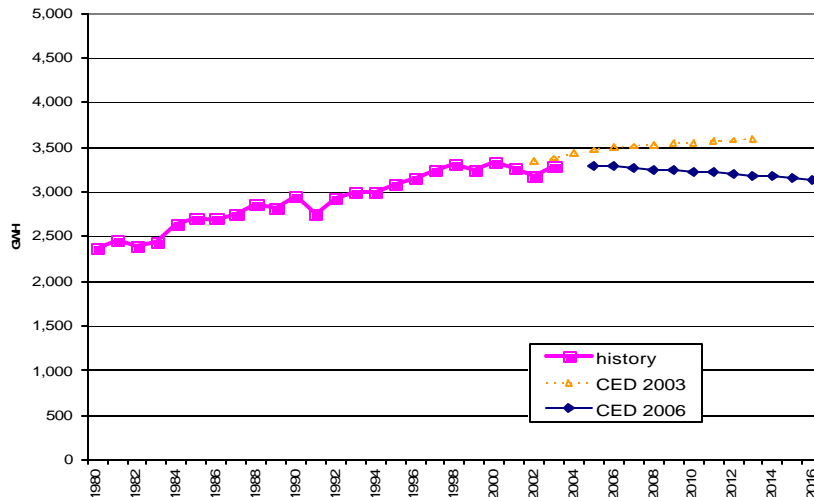
	Consumption (GWH)				Peak (MW)		
	CED 2003	CED 2006	%difference		CED 2003	CED 2006	%difference
1990	2,951	2,955	0.11%		812	812	0.00%
2000	3,320	3,331	0.32%		825	825	0.00%
2003	3,380	3,283	-2.89%		864	834	-3.47%
2008	3,530	3,257	-7.71%		888	860	-3.23%
2013	3,592	3,189	-11.21%		894	842	-5.77%
2016	n/a	3,146			n/a	832	
Annual Average Growth Rates							
1990-2000	1.18%	1.20%			0.15%	0.15%	
2000-2003	0.60%	-0.48%			1.55%	0.36%	
2003-2008	0.87%	-0.16%			0.55%	0.60%	
2003-2013	0.61%	-0.29%			0.34%	0.09%	

Historic values are shaded

Figures 7-1 and 7-2 present annual graphs of these two forecasts. As shown in Figure 7-1, the CED 2006 electricity consumption forecast is lower over the entire forecast period than the CED 2003 forecast and, in fact, is projected to decline slightly over the forecast period. This is primarily due to a lower commercial building forecast driven by the projected impact of the 1998-2005 iterations of nonresidential building standards. Also contributing to the forecast differences are lower long term economic and demographic projections. As a result, the growth rate of the CED

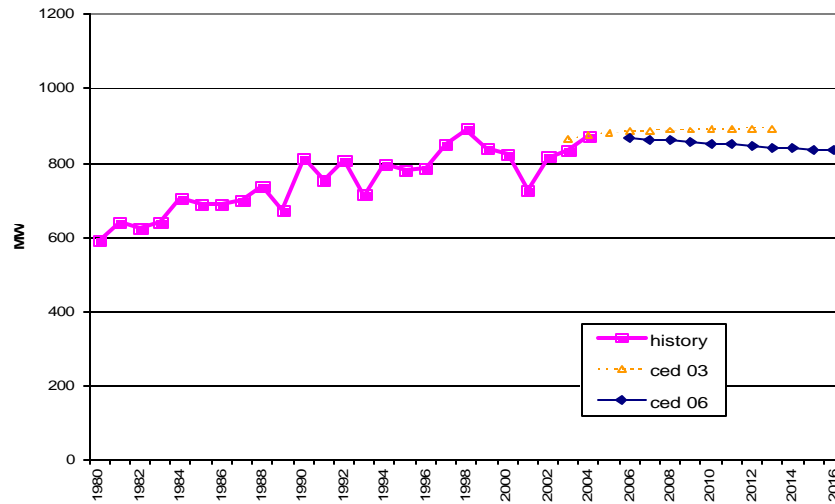
2006 forecast actually declines slightly over the forecast period compared to a slight increase projected in the CED 2003 forecast. Growth in the BGP planning area over the last seven years has been relatively flat.

**Figure 7-1: BGP Planning Area Electricity Forecast**



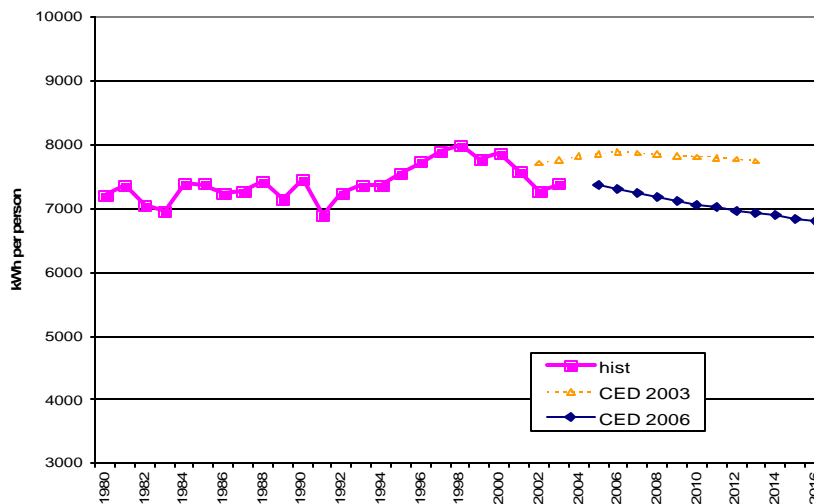
The difference in BGP planning area peak demand forecasts, shown in Figure 7-2, is similar to that of the electricity consumption forecast and is driven by the difference in electricity consumption forecasts. The difference in peak forecasts is slightly less than the difference in consumption forecasts due to the assumption that the 2005 federal air conditioning standards will have a lesser impact on peak than on energy and the use of new residential and industrial load shapes to more accurately account for air conditioning use over the summer air conditioning period and more accurately reflect actual industrial loads.

**Figure 7-2: BGP Planning Area Peak**



Figures 7-3 provides comparisons of BGP planning area per capita electricity consumption forecasts. Per capita consumption in the CED 2006 forecast starts from a lower starting point then declines over the forecast period. This is in contrast to the relatively constant CED 2003 per capita consumption forecast. The new forecast continues the historic pattern of declining per capita consumption exhibited since 1998.

**Figure 7-3: BGP Planning Area per Capita Electricity Consumption**



CED 2006 projected per capita peak demand, shown in Figure 7-4, is lower by a constant amount over the entire forecast period due to a lower starting point. Both forecasts project a decline in per capita peak consumption over the forecast period.

**Figure 7-4: BGP Planning Area per Capita Peak Demand**

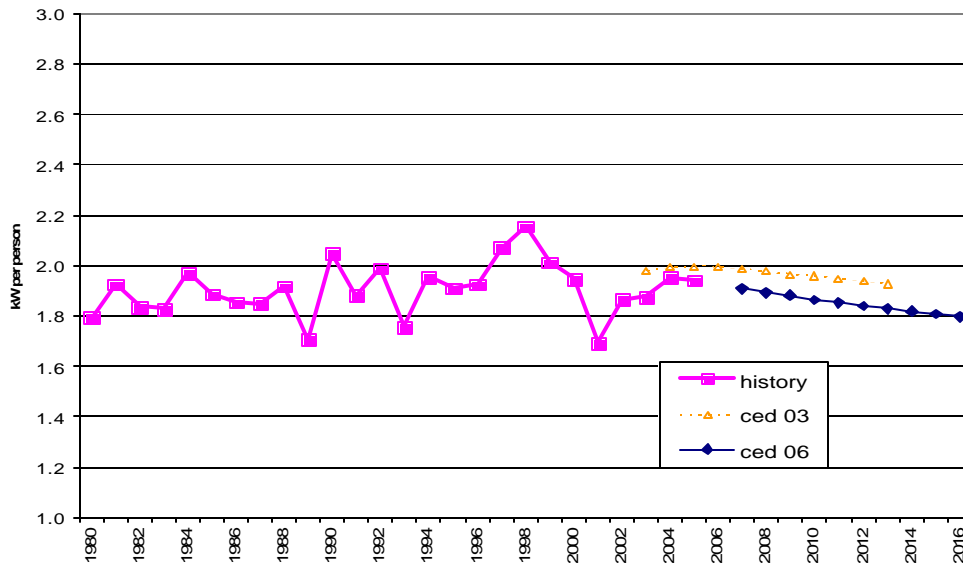
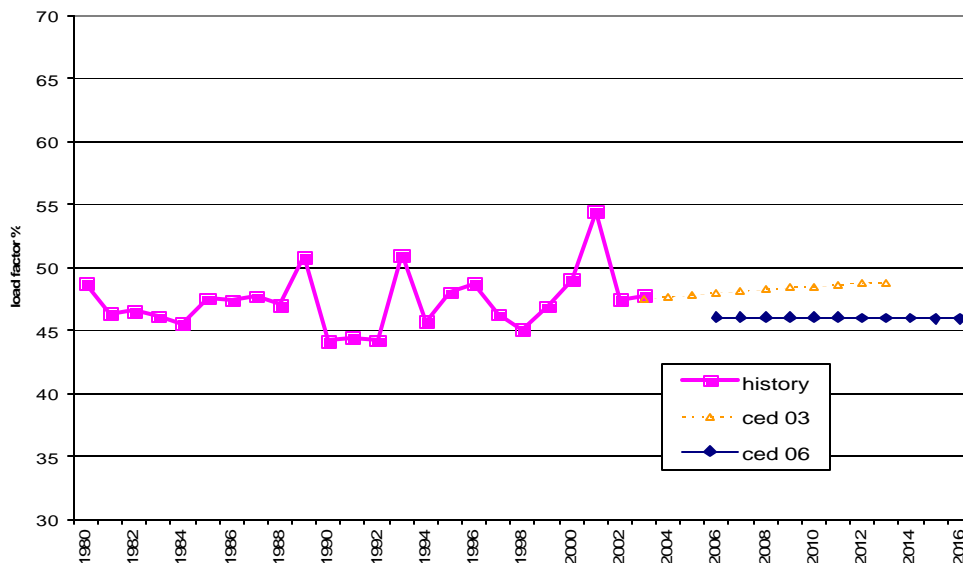


Figure 7-5 provides a comparison of the respective load factors. The load factor is a measure of the relative increase in peak demand with respect to annual electricity consumption. Lower load factors indicate more of a needle peak and higher load factors indicate a more stable load. Actual historic data are confounded by annual weather patterns. The CED 2006 projected load factor is relatively constant over the forecast period. This is in contrast to a slight increase in load factor of the CED 2003 forecast.

**Figure 7-5: BGP Planning Area Load Factor**





## Sector Level Results and Input Assumptions

### *Residential*

Figure 7-6 provides a comparison between the CED 2006 and CED 2003 BGP planning area residential forecasts. The CED 2006 forecast is slightly lower over the forecast period due to lower residential economic and demographic projections.

**Figure 7-6: BGP Planning Area Residential Consumption**

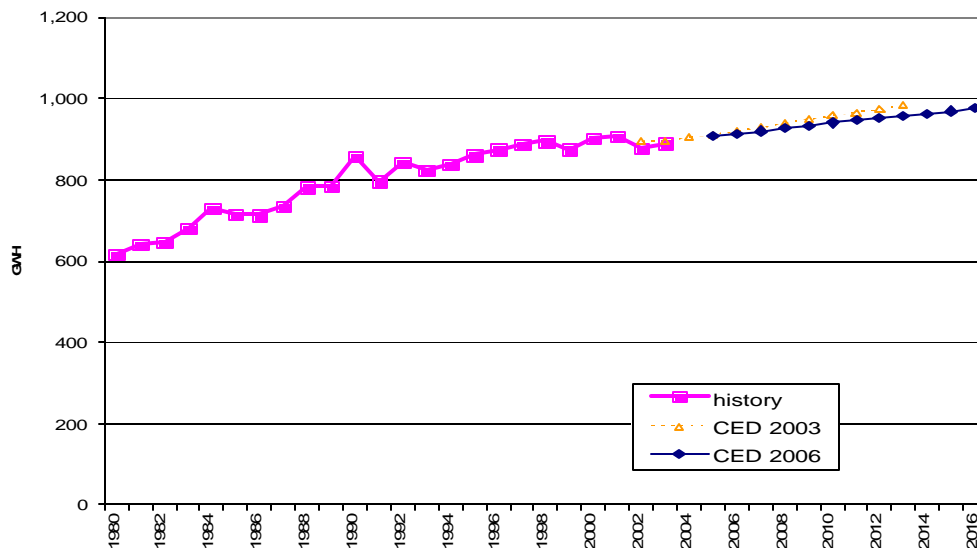
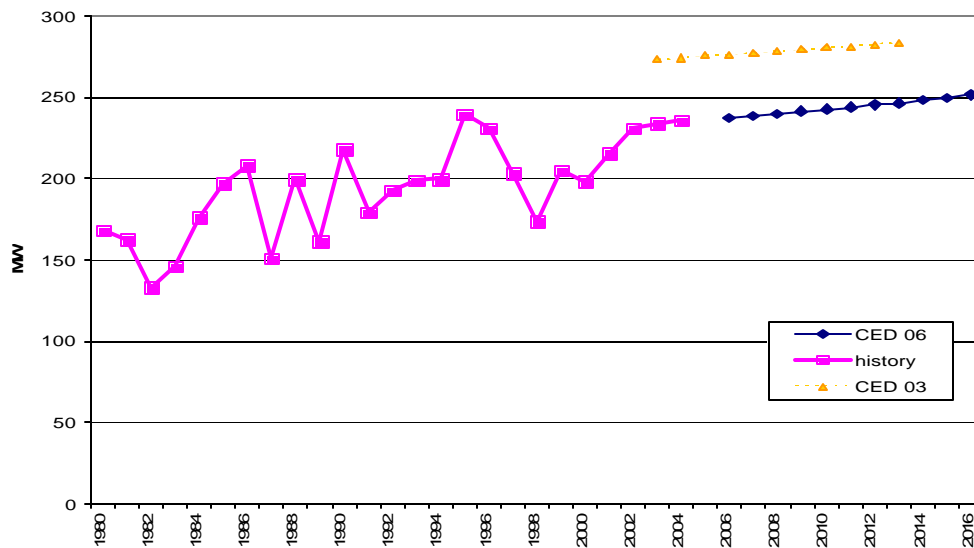


Figure 7-7 provides a comparison of the CED 2006 and CED 2003 residential peak demand forecasts. The CED 2006 residential peak forecast is lower than the CED 2003 forecast. This caused by a lower starting point used in the CED 2006 forecast. Use of new residential and industrial load shapes changed the assumed contribution of residential peak to total system peak in the BGP planning area. Growth rates of the two forecasts are very similar.

**Figure 7-7: BGP Planning Area Residential Peak**



Figures 7-8 and 7-9 provide comparisons of the residential drivers used in the CED 2006 forecast with those used in the CED 2003 forecast. Figure 7-8 provides comparisons of total population, total households and persons per household projections. The CED 2006 forecast of total population in the BGP area is higher in the short and mid term than the CED 2003 forecast due to recent population growth as reported in DOF interim population estimates. Long term CED 2006 growth is lower than the previous forecast after 2006 due to a new DOF long term population projections being lower than their previous forecast. Staff has also increased the projections of persons per household for the BGP planning area based on recent higher estimates provided by the DOF E5-A reports. The rate of growth in household size, however, is less than that used in the CED 2003 forecast. Staff has reduced the previous assumptions of projected growth persons per household to approximately half of the increase seen in the 1990-2000 period. These changes net out to produce a projection of total households for the CED 2006 forecast that is slightly lower than the CED 2003 forecast by the end of the forecast period.

**Figure 7- 8: BGP Planning Area  
Residential Demographic Projections**

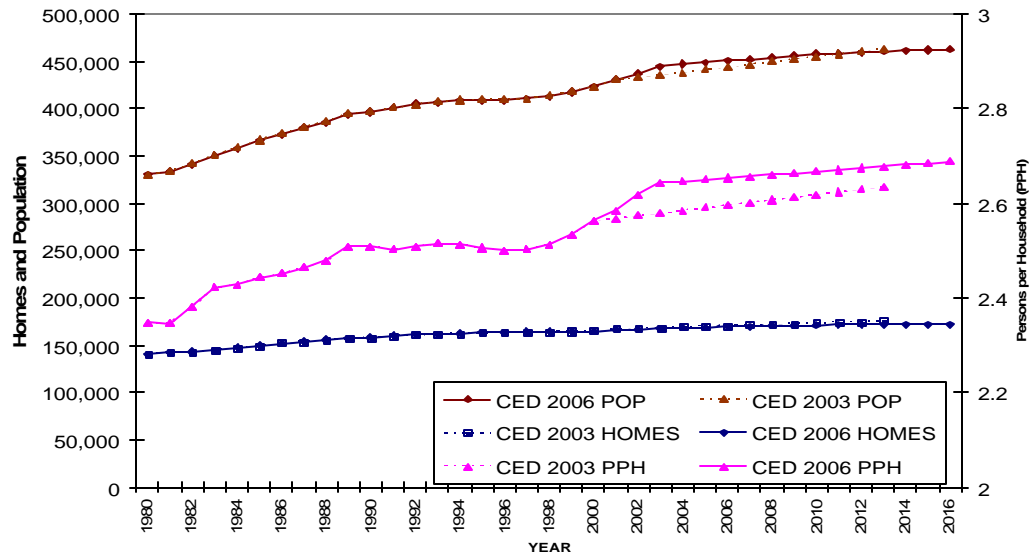


Figure 7-9 provides a comparison of household income between the two forecasts. Household income is derived as the product of per capita income and persons per household. The CED 2006 projection is higher in the short to mid-term projection period because of the use of regional economic forecast data. These data show that, unlike in the PG&E planning area, there was no downturn in household income due to the recession. This higher near term household income serves to increase the residential forecast in the short term in the BGP planning area. In the long term, lower growth in household income projections produce a lower forecast after 2008.

**Figure 7-9: BGP Planning Area Household Income Projections**

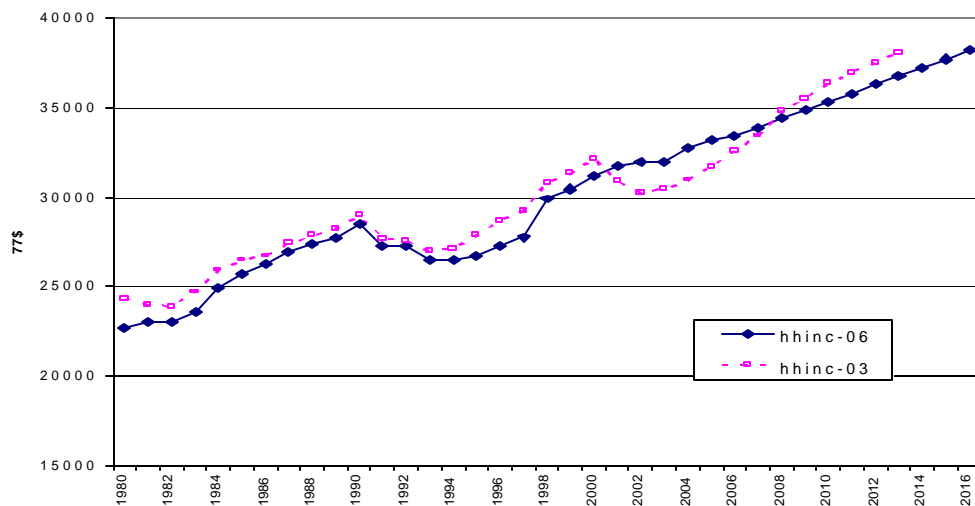
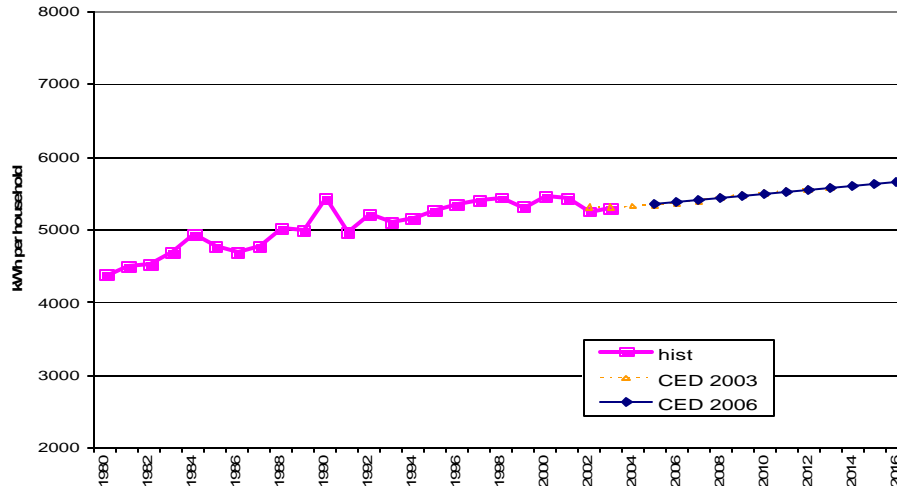


Figure 7-10 presents a comparison of use per household between the two forecasts as well as the 1980-2003 historic series. The projected growth in use per household is essentially the same for both forecasts.

**Figure 7-10: BGP Planning Area Use per Household**



### ***Commercial Building Sector***

Figure 7-11 provides a comparison of the commercial building sector forecasts. The CED 2006 forecast is lower throughout the entire forecast and actually declines. This is in contrast to the CED 2003 forecast which was relatively constant. The decline in the CED 2006 commercial building electricity consumption projections is due to inclusion of savings from various iterations of the commercial building and appliance standards enacted from 1998 to the present. The starting value of the CED 2006 forecast is also slightly lower than was projected by the CED 2003 forecast.

**Figure 7-11: BGP Planning Area Commercial Consumption**

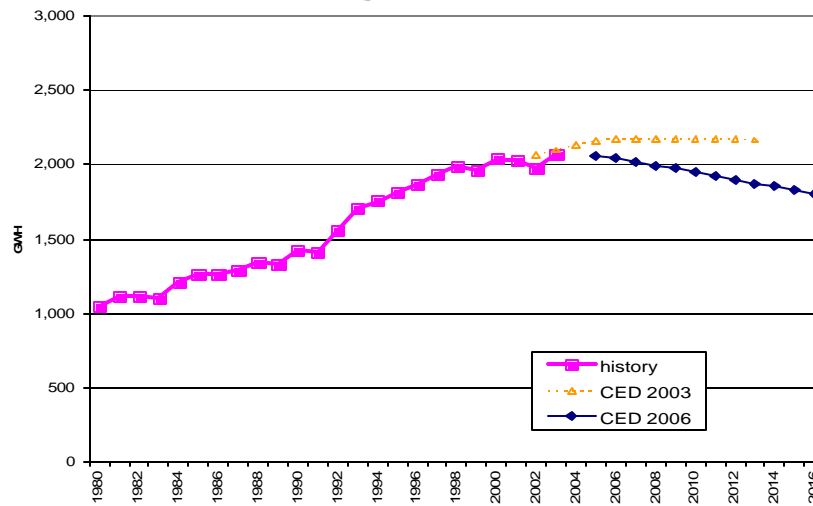
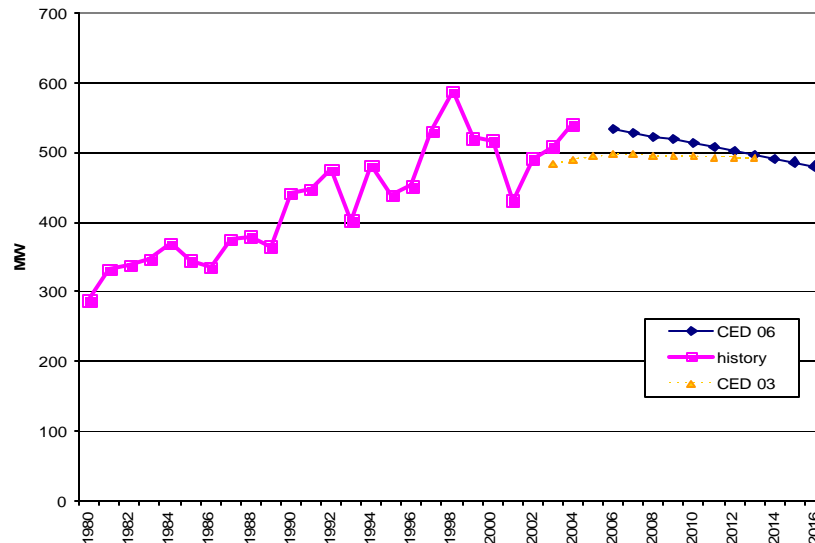


Figure 7-12 provides a comparison of the commercial peak demand forecasts. The CED 2006 forecast is higher in the short and mid term due to a higher starting point. This starting point difference is due to revisions in sector loads which indicate a greater contribution of commercial load to system peak than was estimated and used in the previous staff forecast. The declining growth of the CED 2006 commercial peak forecast produces a slightly lower forecast after 2013.

**Figure 7-12: BGP Planning Area Commercial Sector Peak**



In staff's commercial building sector forecasting model, floorspace by building type (e.g. retail, offices, schools, etc. ) is the key driver of commercial consumption. Figure 7-13 provides a comparison of total commercial floorspace projections. For the BGP planning area the CED 2006 floorspace projections are slightly higher than the CED 2003 floorspace projections.

**Figure 7-13: BGP Planning Area Commercial Floorspace**

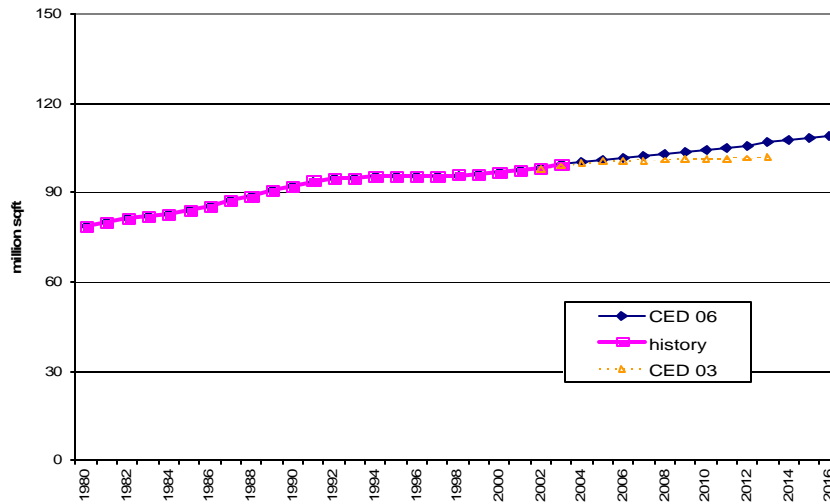
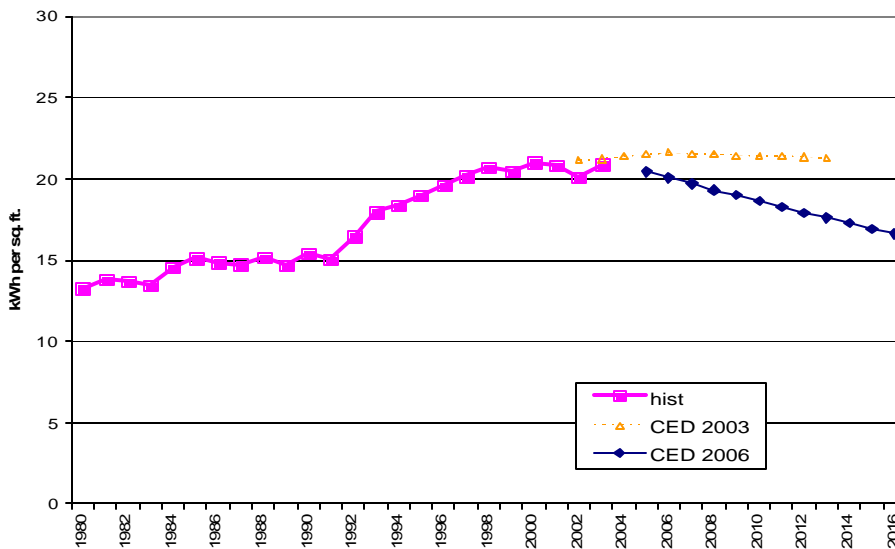


Figure 7-14 provides a comparison of kWh per square foot of the CED 2006 and CED 2003 forecasts. The use per square foot is lower over the entire period in the CED 2006 forecast. Growth declines over the forecast period as a result of impacts from the 1998-2005 iterations of the commercial building and appliance standards. This component of the commercial building sector forecast overcomes the slightly positive growth in floorspace and leads to an overall reduction in electricity consumption through time.

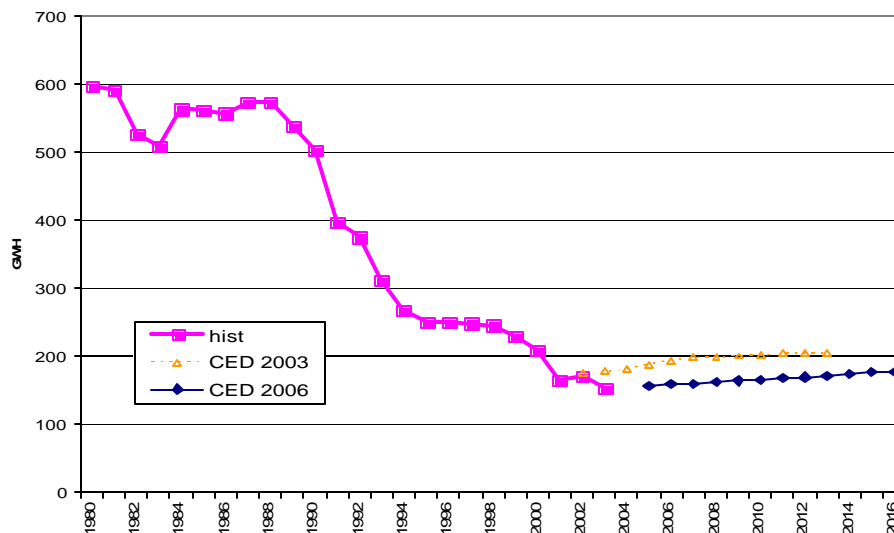
**Figure 7-14: BGP Planning Area Commercial Building Sector kWh per Square Foot**



## Industrial Sector

Figure 7-15 compares the BGP planning area industrial sector electricity consumption forecasts. The CED 2006 industrial electricity consumption forecast is lower than the CED 2003 forecast for the entire forecast period. Because reported industrial consumption for 2003 was lower than projected in CED 2003, CED 2006 has a lower starting point. The growth rates of the two forecasts are very similar. Figure 7-16 compares the industrial sector peak forecasts. The CED 2006 peak is lower throughout the forecast period as the result of a lower starting value, as in the underlying electricity consumption forecast. As in the electricity consumption forecast, the forecast growth rates are very similar.

**Figure 7-15: BGP Planning Area Industrial Consumption**



**Figure 7-16: BGP Planning Area Industrial Sector Peak**

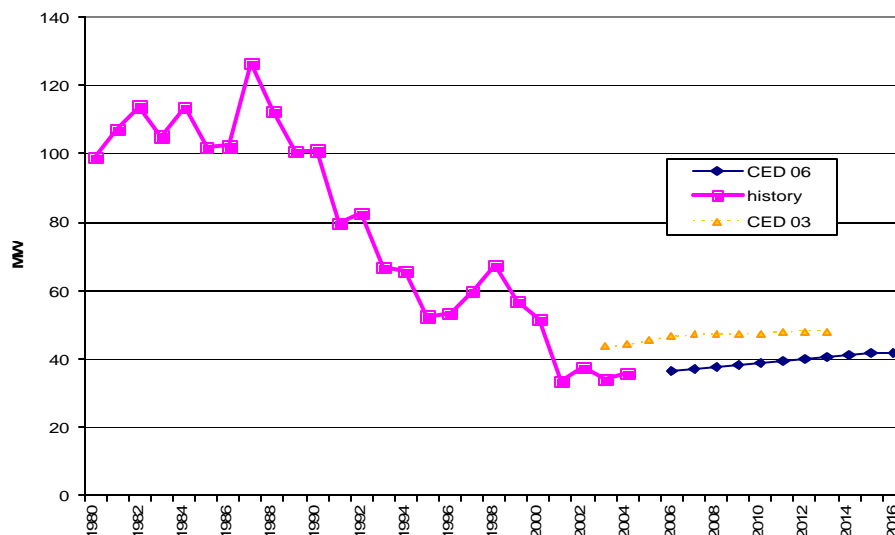
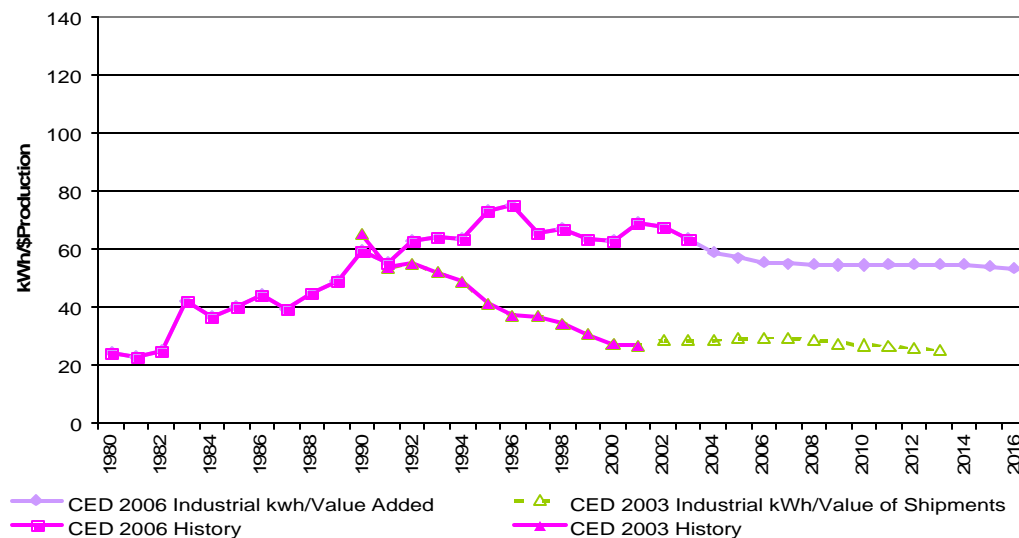


Figure 7-17 provides a comparison of use per dollar value of production between the CED 2006 and CED 2003 forecasts. The CED 2003 forecast used value of shipments provided by the UCLA Anderson School of Business. The CED 2006 forecast uses value added provided by the October 2004 economy.com projections. Kilowatt-hours per dollar of industrial value added in the CED 2006 industrial forecast is projected to decline slightly in the short term and then level out over the remainder of the forecast period, in contrast to the CED 2003 forecast which projected relatively constant values through 2008 and then a slight decline through the end of the forecast.

**Figure 7-17: BGP Planning Area Industrial Use per Production Unit**

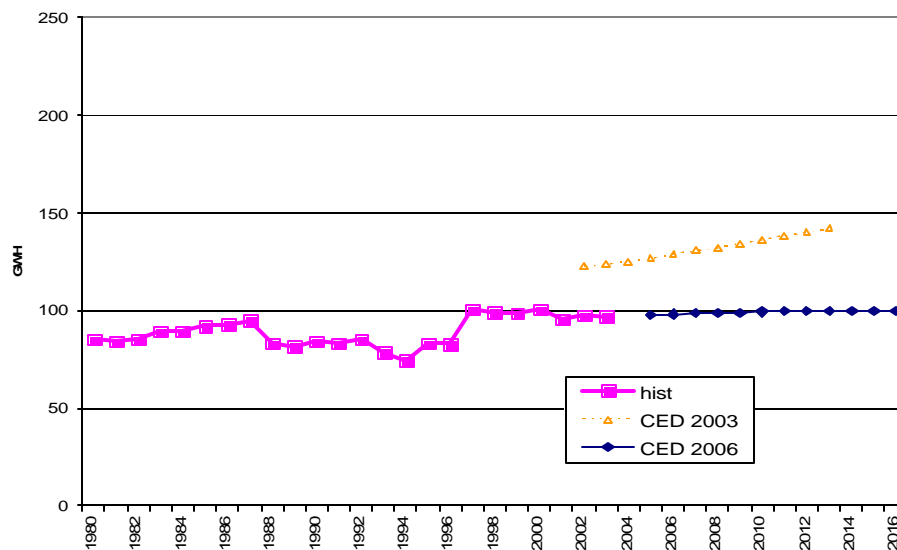


## Other Sectors

Figures 7-18 and 7-19 provide comparisons of the remaining sector electricity consumption forecasts. Figure 7-18 provides a comparison of the transportation, communication and utilities (TCU) sector forecasts. The CED 2006 TCU forecast is lower than the CED 2003 forecast due to an decrease in historic starting value. The CED 2006 forecasted growth rate is relatively constant due to a lower population growth rate. This constant growth also reflects the recent historic trend. Because of lack of accurate historic information the TCU sector was forecasted at a sector level driven by population rather than at a specific industry level as in the previous forecast. Figure 7-19 provides comparisons of the agriculture and water pumping and mining and oil extraction sector forecasts. The CED 2006 agriculture & water pumping forecast is similar to the CED 2003 forecast. The CED 2006 mining and oil extraction forecast is lower in the short and mid term due to a lower starting point. However, anticipated growth in the CED 2006 mining and oil extraction forecast brings the two forecasts close together by the end of the forecast period.



**Figure 7-18: BGP Planning Area Transportation, Communication & Utilities Sector Electricity Consumption**



**Figure 7-19: BGP Planning Area Agriculture & Water Pumping and Mining & Oil Extraction Electricity Consumption Forecasts**

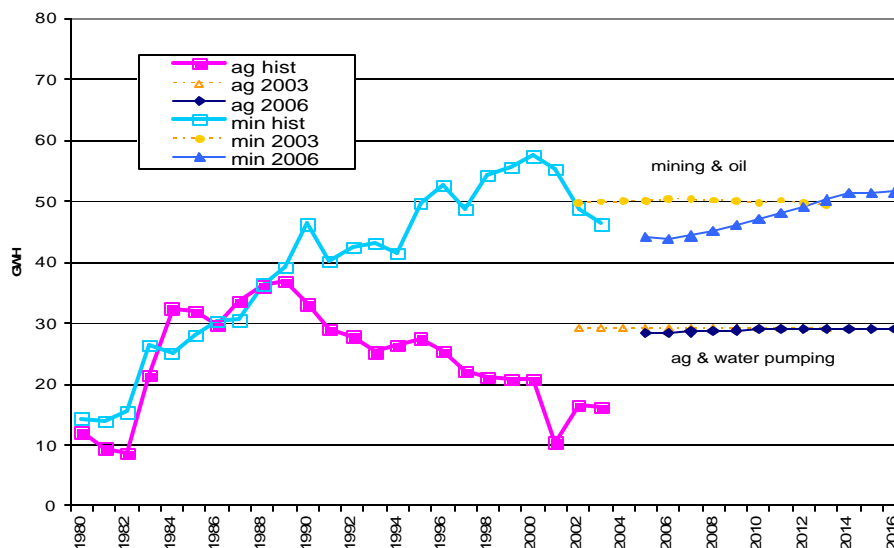
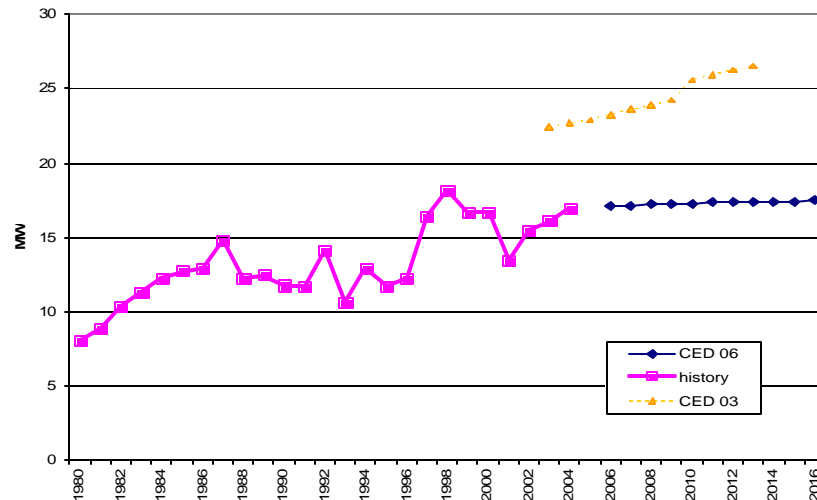


Figure 7-20 provides a comparison of the combined Other Sector peaks for the CED 2006 and CED 2003 forecasts. The CED 2006 forecast starts at a lower level and

remains relatively constant over the forecast. This is consistent with the underlying electricity consumption forecasts.

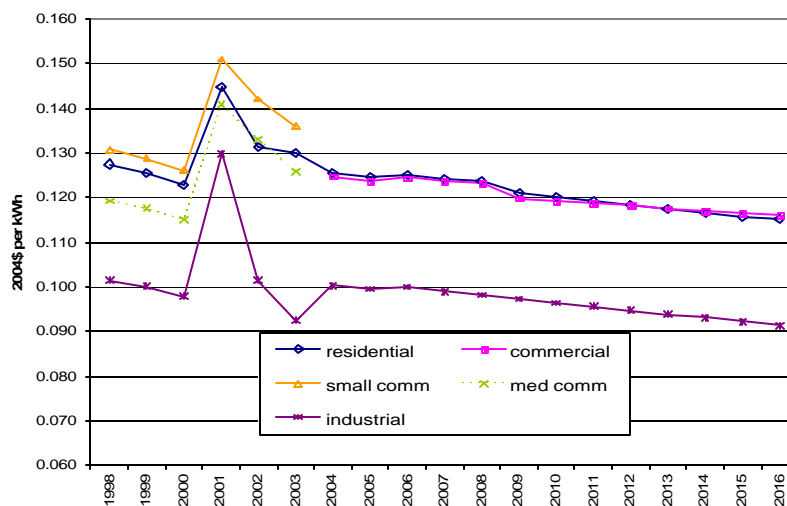
**Figure 7-20: BGP Planning Area Other Sector Peak**



## Electricity Prices

Figure 7-21 shows the sector prices used in the CED 2006 forecast for the BGP planning area. These electricity prices are based on information provided by the three load serving entities in the BGP planning area.<sup>1</sup> The planning area prices represent a weighted average of price projections by customer class received from the three municipal utilities.

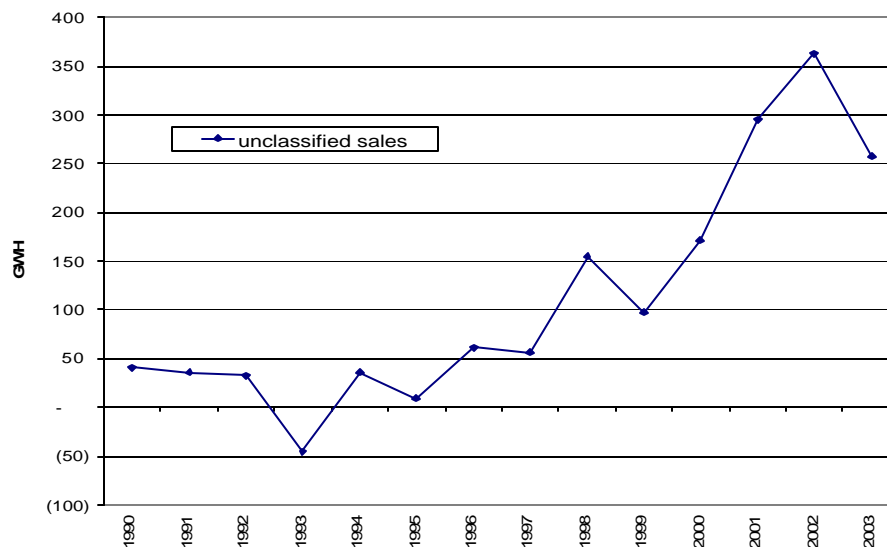
**Figure 7-21: BGP Planning Area Prices Used in Forecast**



## Uncertainty Introduced by Historic Data Inaccuracy

Figure 7-22 provides the recent historic values of unclassified electricity in the BGP planning area. Recent history contains a large amount of electricity consumption which has not been classified by LSEs according to the QFER reporting requirements. In the BGP planning area, recent unclassified consumption has approached 10 percent of total consumption in recent history. In the absence of additional knowledge, this electricity consumption is allocated to the industrial, commercial and TCU sectors proportional to classified sales. If the actual sector distribution of unclassified electricity use is different than the distribution of properly classified electricity, it will impact the forecast adversely. Since commercial and industrial customers have different load shapes misclassifying these customers could result in erroneous estimation of sector consumption, peak demand and growth rates.

**Figure 7-22**  
**BGP Planning Area Historic Unclassified Consumption**



## Uncertainty Introduced by Economic/Demographic Assumptions

Staff switched to Economy.com for its economic projections because the projections it markets are provided at county and MSA levels of disaggregation. It is apparent from the historic county level economic drivers that there are major differences in economic activity in the various regions of California. This enables the CED 2006 forecast to assume different patterns of economic activity in the separate utility planning areas. The UCLA forecast is only provided at a statewide level. Translation of these to individual regions was not considered critical during the hiatus in formal planning prior to enactment of SB 1389 and thus for the CED 2003, energy forecasts

staff prepared economic projections that grew at the same rate for all parts of the state. With the resumption of planning area-based energy assessments in this 2005 *Energy Report* cycle, staff shifted back to preparation of economic/demographic projections tailored to the various sub-regions of the state.

Staff also uses McGraw-Hill Dodge construction data to produce commercial square footage estimates by building type. This data is not disaggregated to a sub-county level of detail. BGP is the smallest planning area for which staff develops demand forecasts. The staff set of disaggregated sector models require a great deal of planning area specific detail. As a small portion of overall Los Angeles County, it is difficult to determine how to partition Los Angeles County values into the portion specific to the planning area. As a fully built out set of cities, Burbank, Glendale and Pasadena are heavily influenced by local decisions regarding redevelopment. Staff's econ/demo assumptions have not been prepared with this degree of local customization. It is possible that one or more of the three municipal utilities will experience a different future than the one projected in this demand forecast.

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<sup>1</sup> All LSEs >200MW peak demand were required to provide electricity price projections by customer sector pursuant to GENERAL INSTRUCTIONS: RETAIL ELECTRICITY PRICE FORECAST ELECTRICITY DATA REQUEST 2003-2016 adopted by Commissioner order, November 3, 2004.

**Form 1.1 - BGP**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Electricity Consumption by Sector (GWh)**

Year	Residential	Commercial	Industrial	Mining	Agricultural	TCU	Streetlighting	Total Consumption
1980	616	1,051	598	14	12	46	40	2,378
1981	641	1,114	592	14	9	46	39	2,455
1982	647	1,117	528	15	9	48	37	2,401
1983	681	1,108	510	26	21	54	35	2,436
1984	730	1,207	565	25	32	57	32	2,648
1985	715	1,272	562	28	32	62	30	2,702
1986	714	1,272	559	30	30	64	29	2,698
1987	735	1,289	574	31	34	66	29	2,757
1988	783	1,351	574	36	36	61	22	2,864
1989	785	1,335	539	39	37	59	23	2,816
1990	858	1,429	504	46	33	62	23	2,955
1991	797	1,415	398	40	29	60	23	2,762
1992	842	1,560	376	43	28	63	22	2,934
1993	825	1,712	312	43	25	56	23	2,996
1994	839	1,757	269	42	26	52	23	3,007
1995	862	1,817	250	50	28	61	23	3,089
1996	875	1,874	250	53	25	63	20	3,160
1997	889	1,933	249	49	22	75	26	3,243
1998	896	1,989	247	54	21	73	26	3,307
1999	876	1,968	230	56	21	74	25	3,249
2000	903	2,038	210	57	21	76	25	3,331
2001	907	2,036	165	55	10	78	17	3,268
2002	879	1,976	171	49	16	82	16	3,189
2003	891	2,079	154	46	16	82	15	3,283
2006	913	2,042	161	44	28	83	15	3,287
2007	920	2,018	162	44	29	84	15	3,271
2008	927	1,993	164	45	29	84	15	3,257
2009	934	1,976	166	46	29	84	15	3,250
2010	941	1,951	168	47	29	85	15	3,235
2011	946	1,926	170	48	29	85	15	3,219
2012	952	1,902	172	49	29	85	15	3,204
2013	958	1,878	175	50	29	85	14	3,189
2014	963	1,855	177	51	29	85	14	3,175
2015	970	1,832	179	51	29	86	14	3,161
2016	976	1,810	180	52	29	86	14	3,146

**Annual Growth Rates (%)**

1980-1990	3.4	3.1	-1.7	12.4	10.6	3.0	-5.4	2.2
1990-2000	0.5	3.6	-8.4	2.2	-4.5	2.1	0.8	1.2
2000-2003	-0.5	0.7	-9.8	-7.0	-8.1	2.8	-15.6	-0.5
2003-2008	0.8	-0.8	1.3	-0.5	12.2	0.4	-0.2	-0.2
2008-2016	0.6	-1.2	1.1	1.7	0.2	0.2	-0.4	-0.4
2003-2016	0.7	-1.1	1.2	0.8	4.6	0.3	-0.3	-0.3

**Form 1.2 - BGP**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Net Energy for Load (GWh)**

Year	Total Consumption	Net Losses	Gross Generation	Private Supply	Net Energy for Load
1980	2,378	152	2,530	0	2,530
1981	2,455	157	2,612	0	2,612
1982	2,401	154	2,555	0	2,555
1983	2,436	156	2,592	0	2,592
1984	2,648	169	2,817	0	2,817
1985	2,702	173	2,875	0	2,875
1986	2,698	173	2,871	0	2,871
1987	2,757	176	2,934	0	2,934
1988	2,864	183	3,048	0	3,048
1989	2,816	180	2,997	0	2,997
1990	2,955	189	3,144	0	3,144
1991	2,762	177	2,939	0	2,939
1992	2,934	188	3,122	0	3,122
1993	2,996	192	3,188	0	3,188
1994	3,007	192	3,199	0	3,199
1995	3,089	198	3,287	0	3,287
1996	3,160	202	3,362	0	3,362
1997	3,243	208	3,450	0	3,450
1998	3,307	212	3,518	0	3,518
1999	3,249	208	3,457	0	3,457
2000	3,331	213	3,544	0	3,544
2001	3,268	209	3,477	0	3,477
2002	3,189	204	3,393	0	3,393
2003	3,283	210	3,493	0	3,493
2006	3,287	210	3,497	0	3,497
2007	3,271	209	3,481	0	3,481
2008	3,257	208	3,466	0	3,466
2009	3,250	208	3,458	0	3,458
2010	3,235	207	3,443	0	3,443
2011	3,219	206	3,425	0	3,425
2012	3,204	205	3,409	0	3,409
2013	3,189	204	3,393	0	3,393
2014	3,175	203	3,378	0	3,378
2015	3,161	202	3,363	0	3,363
2016	3,146	201	3,348	0	3,348

**Annual Growth Rates (%)**

1980-1990	2.2	2.2	2.2	2.2
1990-2000	1.2	1.2	1.2	1.2
2000-2003	-0.5	-0.5	-0.5	-0.5
2003-2008	-0.2	-0.2	-0.2	-0.2
2008-2016	-0.4	-0.4	-0.4	-0.4
2003-2016	-0.3	-0.3	-0.3	-0.3

**Form 1.3 - BGP**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Coincident Peak Demand by Sector (MW)**

Year	Residential		Commercial		Industrial			Total Industrial	Agr.	TCU & Street-lighting	Total
	Base Load	Weather Sensitive	Base Load	Weather Sensitive	Process	Assembly	Mining				
1990	109	109	269	173	5	85	10	101	2	10	773
1991	87	92	270	177	5	65	10	80	2	10	718
1992	115	78	288	189	5	67	10	83	2	12	767
1993	86	113	267	136	5	52	10	67	1	9	679
1994	123	77	325	156	5	50	10	66	2	11	760
1995	115	124	293	146	5	37	10	52	2	10	743
1996	120	111	300	152	5	37	11	53	2	11	749
1997	117	87	345	185	5	43	12	60	2	15	810
1998	115	58	391	198	5	47	15	68	2	16	848
1999	142	63	354	168	5	39	14	57	2	14	800
2000	140	59	352	166	4	33	14	52	2	14	785
2001	118	98	276	155	3	20	11	34	1	12	694
2002	97	134	312	180	5	21	11	38	1	14	776
2003	114	121	306	204	5	19	10	34	2	15	794
2004	102	134	319	222	5	21	10	36	2	15	830
2006	103	135	313	221	5	21	10	37	2	15	825
2007	103	136	309	219	5	22	10	37	2	15	821
2008	104	136	305	218	5	22	10	38	2	15	818
2009	105	137	302	217	5	22	11	38	2	15	816
2010	106	137	298	215	5	22	11	39	2	15	812
2011	106	138	294	213	5	23	11	39	2	15	808
2012	107	138	291	211	6	23	11	40	2	15	805
2013	108	139	287	210	6	23	12	41	2	15	801
2014	108	140	283	208	6	24	12	41	2	15	798
2015	109	141	280	206	6	24	12	42	2	15	795
2016	109	142	276	205	6	24	12	42	2	15	792

**Annual Growth Rates (%)**

1980-1990	1.9	3.4	3.9	5.1	5.6	-0.8	13.0	0.2	12.3	2.8	3.2
1990-2000	2.5	-6.0	2.7	-0.4	-1.7	-9.0	3.1	-6.5	2.5	3.7	0.2
2000-2001	-15.9	66.8	-21.5	-6.6	-31.5	-41.0	-21.7	-34.9	-41.7	-15.4	-11.6
2000-2003	-6.7	27.2	-4.6	7.1	3.7	-16.6	-11.1	-12.9	-13.1	0.5	0.4
2003-2008	-1.7	2.4	0.0	1.3	1.6	2.6	1.0	2.0	6.9	0.6	0.6
2008-2016	0.6	0.6	-1.2	-0.8	0.9	1.2	1.9	1.4	0.1	0.2	-0.4
2003-2016	-0.3	1.3	-0.8	0.0	1.1	1.7	1.6	1.6	2.7	0.4	0.0

**Form 1.4 - BGP Planning Area**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Peak Demand (MW)**

Year	Total End Use Load	Net Losses	Gross Generation	Private Supply	Net Peak Demand	Load Factor (%)
1980	564	29	593	0	593	48.7
1981	612	31	643	0	643	46.4
1982	596	30	626	0	626	46.6
1983	610	31	641	0	641	46.2
1984	672	34	706	0	706	45.5
1985	657	34	691	0	691	47.5
1986	658	34	692	0	692	47.4
1987	668	34	702	0	702	47.7
1988	704	36	740	0	740	47.0
1989	640	33	673	0	673	50.9
1990	773	39	812	0	812	44.2
1991	718	37	755	0	755	44.5
1992	767	39	806	0	806	44.2
1993	679	35	714	0	714	51.0
1994	760	39	799	0	799	45.7
1995	743	38	781	0	781	48.0
1996	749	38	787	0	787	48.8
1997	810	41	851	0	851	46.3
1998	848	43	891	0	891	45.1
1999	800	41	841	0	841	46.9
2000	785	40	825	0	825	49.0
2001	694	35	729	0	729	54.4
2002	776	40	816	0	816	47.5
2003	794	40	834	0	834	47.8
2004	830	42	873	0	873	46.1
2006	825	42	867	0	867	46.0
2007	821	42	863	0	863	46.0
2008	818	42	860	0	860	46.0
2009	816	42	858	0	858	46.0
2010	812	41	853	0	853	46.0
2011	808	41	850	0	850	46.0
2012	805	41	846	0	846	46.0
2013	801	41	842	0	842	46.0
2014	798	41	839	0	839	46.0
2015	795	41	836	0	836	45.9
2016	792	40	832	0	832	45.9

**Annual Growth Rates (%)**

1990-2000	0.2	0.2	0.2	0.2
2000-2001	-11.6	-11.6	-11.6	-11.6
2000-2003	0.4	0.4	0.4	0.4
2003-2008	0.6	0.6	0.6	0.6
2008-2016	-0.4	-0.4	-0.4	-0.4
2003-2016	0.0	0.0	0.0	0.0



**Form 1.5 - BGP**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Noncoincident Peak Demand Temperature Scenarios**

Year	1-in-2 Temperatures	1-in-5 Temperatures	1-in-10 Temperatures	1-in-20 Temperatures	1-in-5 Multiplier	1-in-10 Multiplier	1-in-20 Multiplier
2006	867	916	925	927	1.057	1.067	1.069
2007	863	912	921	923	1.057	1.067	1.069
2008	860	908	917	919	1.057	1.067	1.069
2009	858	906	915	917	1.057	1.067	1.069
2010	853	902	911	913	1.057	1.067	1.069
2011	850	898	907	909	1.057	1.067	1.069
2012	846	894	903	904	1.057	1.067	1.069
2013	842	890	899	900	1.057	1.067	1.069
2014	839	886	895	897	1.057	1.067	1.069
2015	836	883	892	894	1.057	1.067	1.069
2016	832	879	888	890	1.057	1.067	1.069

**Form 2.2 - BGP Planning Area**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Planning Area Economic and Demographic Assumptions**

Year	Population	Households	Persons per Household	Per Capita Income (2003\$)	Industrial Value Added (Millions 2003\$)
1980	330,171	140,630	2.348	24,012	597
1981	333,865	142,312	2.346	24,382	614
1982	341,251	143,207	2.383	23,995	622
1983	350,753	144,789	2.423	24,181	633
1984	358,215	147,495	2.429	25,463	685
1985	366,082	149,826	2.443	26,133	700
1986	373,071	152,182	2.451	26,552	689
1987	379,823	154,030	2.466	27,097	785
1988	385,817	155,668	2.478	27,422	817
1989	394,238	157,105	2.509	27,440	801
1990	396,675	158,063	2.510	28,129	779
1991	401,208	160,303	2.503	26,983	727
1992	404,966	161,440	2.508	26,958	677
1993	406,216	161,500	2.515	26,120	675
1994	408,612	162,525	2.514	26,083	654
1995	408,938	163,198	2.506	26,472	680
1996	408,943	163,530	2.501	27,068	703
1997	411,164	164,300	2.503	27,529	746
1998	413,319	164,437	2.514	29,510	809
1999	417,595	164,789	2.534	29,813	879
2000	423,850	165,339	2.564	30,195	917
2001	430,914	166,698	2.585	30,495	801
2002	437,790	167,223	2.618	30,259	724
2003	444,758	168,214	2.644	30,029	728
2004	447,247	168,940	2.647	30,728	752
2005	449,017	169,393	2.651	31,043	776
2006	450,778	169,841	2.654	31,216	791
2007	452,532	170,285	2.658	31,603	808
2008	454,278	170,724	2.661	32,064	829
2009	456,016	171,159	2.664	32,474	847
2010	457,747	171,590	2.668	32,846	866
2011	458,646	171,708	2.671	33,255	884
2012	459,543	171,825	2.674	33,666	903
2013	460,434	171,939	2.678	34,041	922
2014	461,323	172,052	2.681	34,396	940
2015	462,207	172,162	2.685	34,862	955
2016	463,086	172,270	2.688	35,298	968

**Annual Growth Rates (%)**

1990-2000	0.7	0.5	0.2	0.7	1.6
2000-2001	1.7	0.8	0.8	1.0	-12.7
2000-2003	1.6	0.6	1.0	-0.2	-7.4
2003-2008	0.4	0.3	0.1	1.3	2.6
2008-2016	0.2	0.1	0.1	1.2	2.0
2003-2016	0.3	0.2	0.1	1.3	2.2

**Form 2.3a - BGP Planning Area**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Electricity Rate Forecast (2003 cents/kwh)**

Year	GDP Implicit Price Deflator	Residential	Small Commercial	Medium Commercial	Industrial
1990	75.49	11.93	14.70	14.70	10.24
1991	78.13	11.45	14.22	14.22	9.97
1992	79.92	11.56	14.36	14.36	10.34
1993	81.77	11.69	14.88	14.88	10.36
1994	83.51	11.81	15.33	15.33	10.63
1995	85.22	11.42	14.88	14.88	10.21
1996	86.83	11.06	14.47	14.47	10.10
1997	88.28	12.90	11.68	11.68	10.27
1998	89.26	12.76	13.07	11.93	10.15
1999	90.54	12.58	12.89	11.76	10.01
2000	92.52	12.31	12.61	11.51	9.80
2001	94.74	14.48	15.11	14.09	12.99
2002	96.31	13.16	14.21	13.30	10.14
2003	98.07	12.98	13.60	12.59	9.25
2004	100.00	12.54	12.49	12.49	10.04
2005	101.51	12.46	12.38	12.38	9.96
2006	103.64	12.53	12.45	12.45	10.00
2007	105.58	12.44	12.38	12.38	9.91
2008	107.36	12.36	12.33	12.33	9.82
2009	109.26	12.10	11.99	11.99	9.74
2010	111.24	12.01	11.93	11.93	9.65
2011	113.25	11.92	11.88	11.88	9.56
2012	115.23	11.84	11.82	11.82	9.48
2013	117.23	11.76	11.77	11.77	9.39
2014	119.25	11.67	11.71	11.71	9.31
2015	121.31	11.59	11.65	11.65	9.23
2016	123.42	11.51	11.60	11.60	9.15

**Annual Growth Rates (%)**

1990-2000	2.1	0.3	-1.5	-2.4	-0.4
2000-2001	2.4	17.6	19.8	22.4	32.6
2000-2003	2.0	1.8	2.5	3.0	-1.9
2003-2008	1.8	-1.0	-1.9	-0.4	1.2
2008-2016	1.8	-0.9	-0.8	-0.8	-0.9
2003-2016	1.8	-0.9	-1.2	-0.6	-0.1

# CHAPTER 8

## OTHER PLANNING AREA

The Other planning area is a collection of independent utilities not covered in previous chapters utility planning areas. The individual utilities included within the Other planning area do not plan on a coordinated basis. California utilities included in the Other planning area are Imperial Irrigation District, and Truckee Donner Public Utility District. Also included in the Other planning area are the California portions of Sierra Pacific, PacifiCorp, and Surprise Valley.

This chapter is organized in a fashion similar to previous chapters. First, forecasted total and per capita consumption and peak loads for the planning area are presented and compared to those of the CED 2003 forecast. Then sector inputs and results are discussed.

### Forecast Results

Table 8-1 presents a comparison electricity consumption and peak demand for selected years.

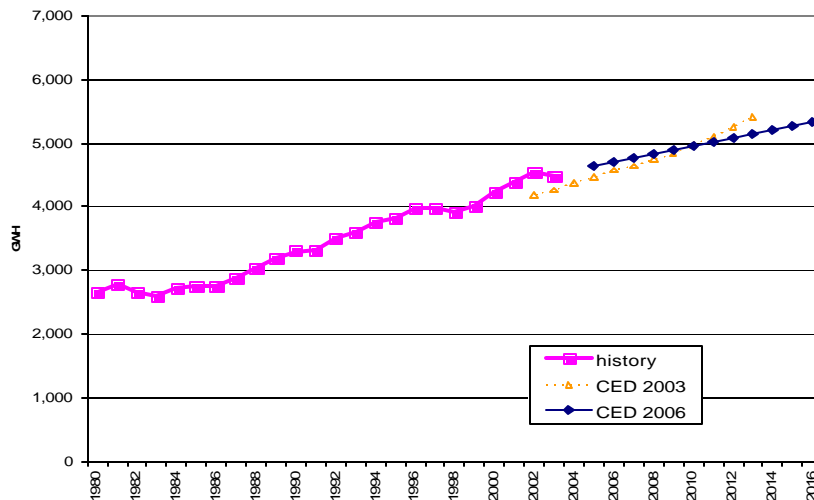
**Table 8-1: Other Planning Area Forecast Comparison**

	Consumption (GWH)				Peak (MW)		
	CED 2003	CED 2006	%difference		CED 2003	CED 2006	%difference
1990	3310	3310	0.00%		801	801	0.01%
2000	4227	4236	0.21%		1023	1025	0.23%
2003	4262	4495	5.46%		1049	1144	9.03%
2008	4740	4833	1.95%		1172	1230	4.98%
2013	5415	5143	-5.02%		1354	1310	-3.27%
2016	n/a	5326			n/a	1357	
Annual Average Growth Rates							
1990-2000	2.48%	2.50%			2.48%	2.50%	
2000-2003	0.27%	1.99%			0.84%	3.71%	
2003-2008	2.15%	1.46%			2.25%	1.47%	
2003-2013	2.42%	1.36%			2.59%	1.37%	

Historic values are shaded

Figures 8-1 and 8-2 present a comparison of the CED 2006 forecast with the CED 2003 forecast. As shown in Figure 8-1, the CED 2006 electricity consumption forecast is higher in the near term than the CED 2003 forecast. This is due to a higher 2003 historic starting value than was projected by the CED 2003 forecast. The growth rate of the CED 2006 forecast is lower than the previous forecast, which results in the CED 2006 long term forecast being lower than the CED 2003 forecast after 2011. The lower growth rate of the CED 2006 forecast is caused by lower growth in projected economic and demographic variables than were used in the previous forecast. Also contributing to the forecast difference is a commercial building forecast which has been reduced to account for increases in efficiency due to the 1998-2005 iterations of nonresidential building standards.

**Figure 8-1: Other Planning Area Electricity Forecast**



The difference in Other planning area peak demand forecasts, shown in Figure 8-2, is similar to that of the electricity consumption forecast and is driven by the difference in that forecast. Due to lack of available sector load data, the Other planning area peak is not modeled separately from the consumption forecast as in the previous planning areas. The Other planning area peak forecast is derived by applying the historic average Imperial Irrigation District load factor of .4683 to the consumption forecast for the entire planning area.

**Figure 8-2: Other Planning Area Peak**

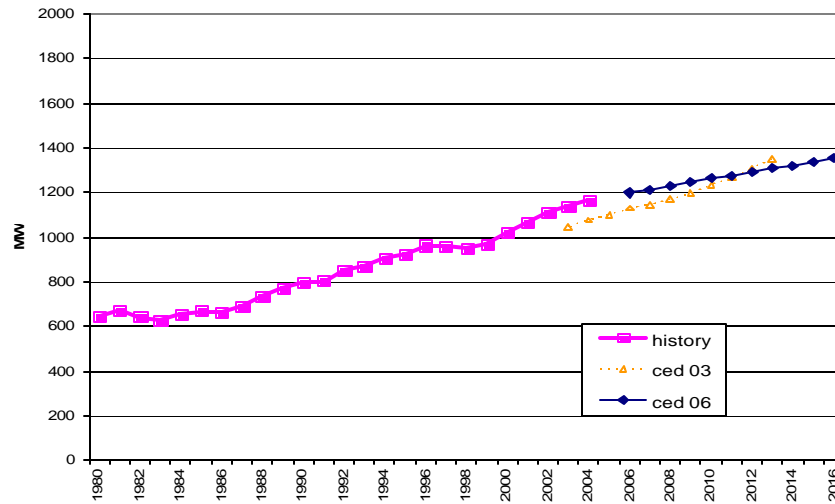
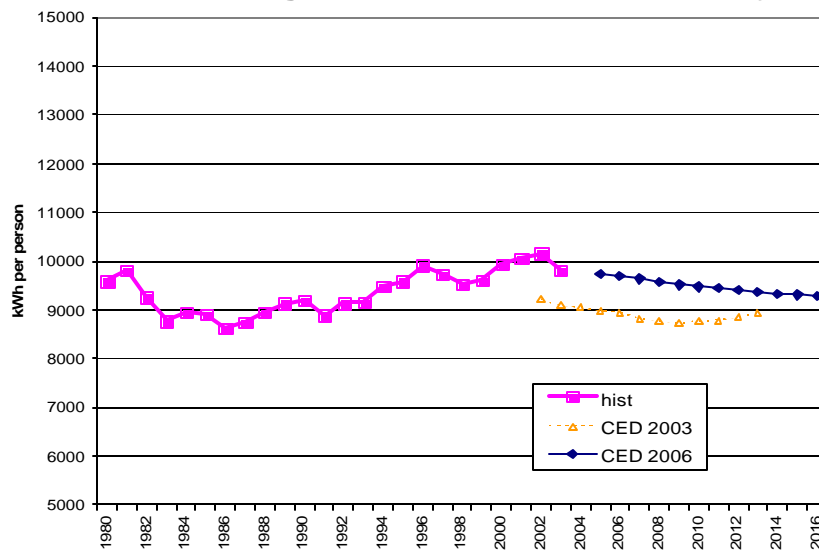


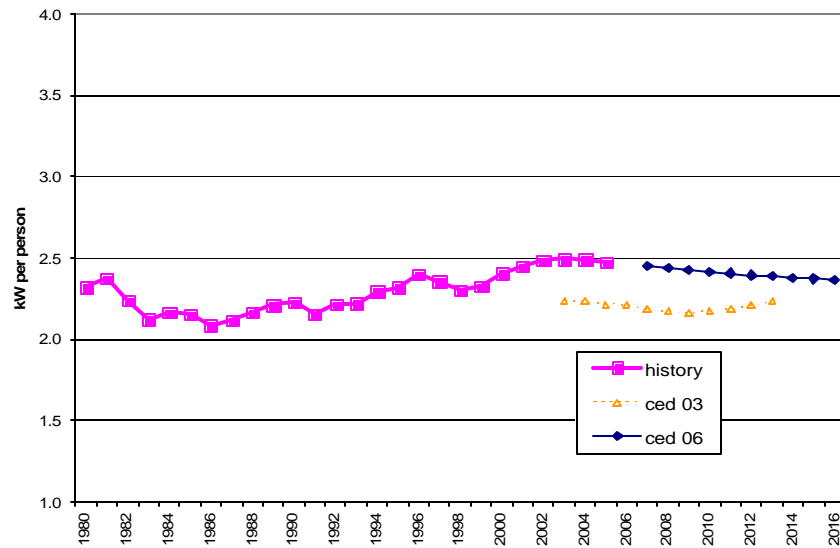
Figure 8-3 provides comparisons of Other planning area per capita electricity consumption between the CED 2006 and CED 2003 forecasts. Per capita consumption in the CED 2006 forecast starts from a higher starting point but is projected to decline over the forecast period in a pattern similar to the CED 2003 forecast.

**Figure 8-3: Other Planning Area per Capita Electricity Consumption**



The forecast of per capita peak demand, shown in Figure 8-4, mirrors the electricity consumption forecast pattern.

**Figure 8-4: Other Planning Area per Capita Peak Demand**



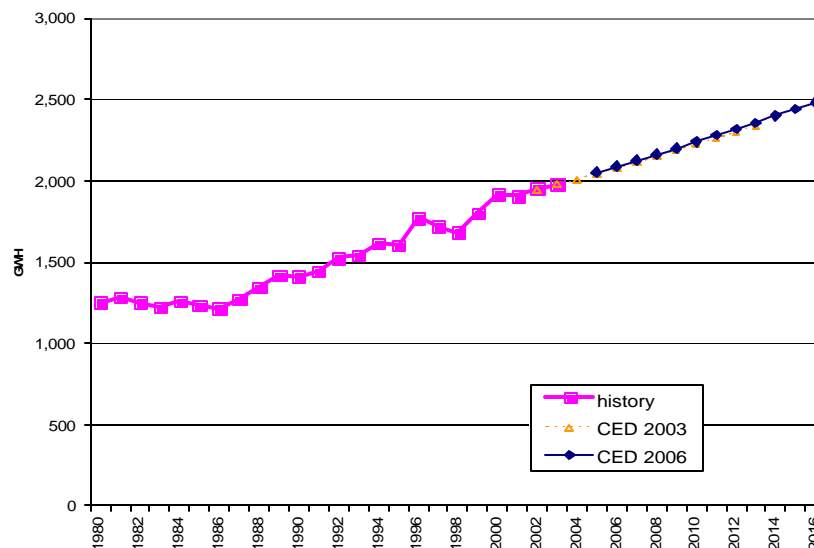
The load factor is a measure of the relative increase in peak demand with respect to annual electricity consumption. For the Other planning area, the historic average IID load factor of .4683 was used to determine the Other planning area peak forecast. This load factor remains constant throughout the forecast period.

## Sector Level Results and Input Assumptions

### *Residential*

Figure 8-5 provides a comparison between the CED 2006 and CED 2003 Other planning area residential forecasts. The CED 2006 forecast is essentially the same as the CED 2003 forecast.

**Figure 8-5: Other Planning Area Residential Consumption**



Figures 8-6 provides a comparison of the residential drivers used in the CED 2006 forecast with those used in the CED 2003 forecast. Figure 8-6 provides comparisons of total population, total households and persons per household projections. The CED 2006 forecast of total population is lower than the CED 2003 forecast due to recent DOF interim population estimates. The mid and long term CED 2006 growth is lower than the previous forecast after 2006 due to new DOF long term population projections being lower than their previous projections. Staff has decreased projections of persons per household for the Other planning area based on recent estimates provided by the DOF E5-A reports. Staff has reduced the previous assumptions of projected growth in persons per household to approximately half of the increase seen in the 1990-2000 period. These changes net out to produce a projection of total households for the CED 2006 forecast that is slightly lower than the CED 2003 forecast by the end of the forecast period.



**Figure 8-6: Other Planning Area  
Residential Demographic Projections**

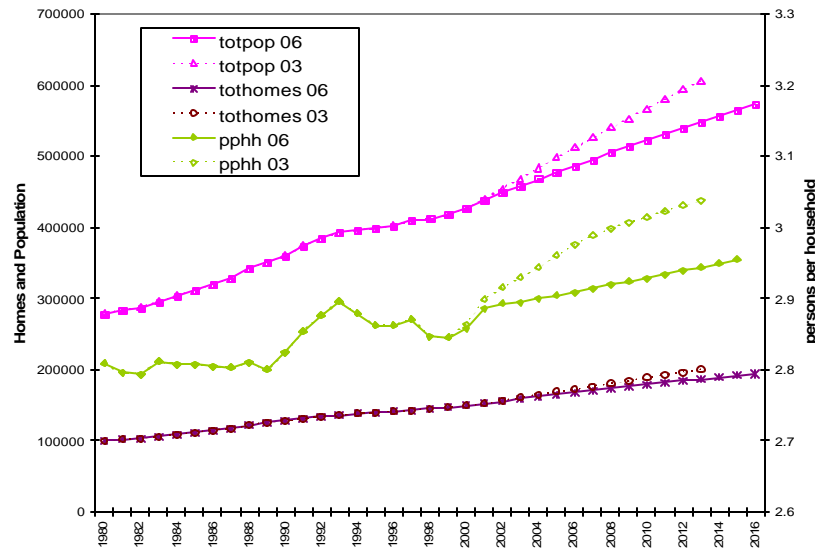
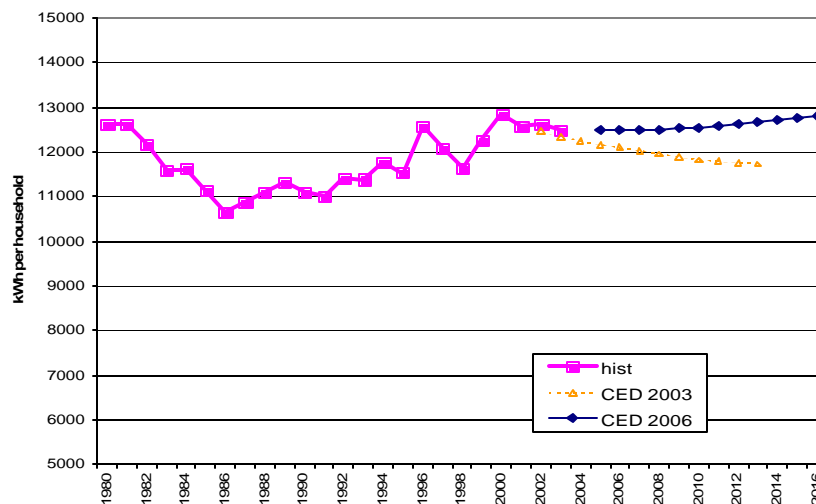


Figure 8-7 presents a comparison of use per household between the two forecasts as well as the 1980-2003 historic series. The projected growth in use per household slightly increases in the CED 2006 forecast in contrast to the decline projected in the CED 2003 forecast. The slight increase is more consistent with recent historic trends than was the short-term decline of the 2001-2003 period which was projected forward in the previous forecast.

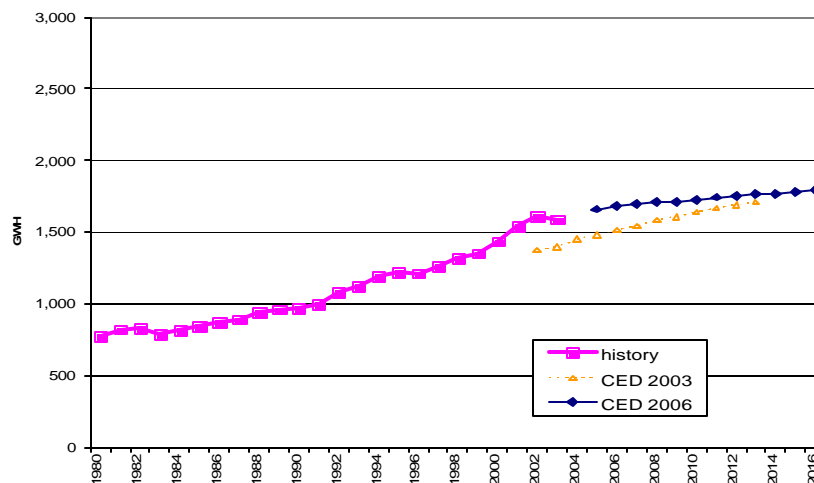
**Figure 8-7: Other Planning Area Use per Household**



## Commercial Building Sector

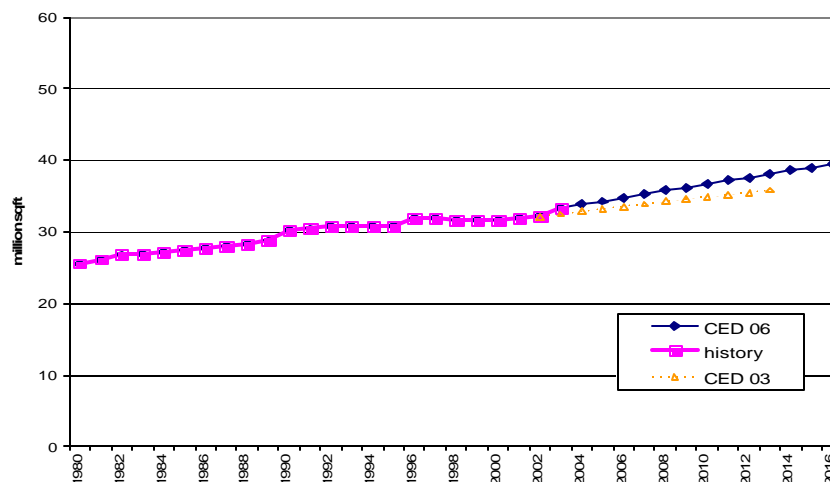
Figure 8-8 provides a comparison of the commercial building sector forecasts. The CED 2006 forecast is higher than the CED 2003 forecast due to a higher historic starting point. The growth rate of the CED 2006 commercial forecast is lower due to inclusion of savings from various iterations of the commercial building and appliance standards enacted from 1998 to the present

**Figure 8-8: Other Planning Area Commercial Building Sector Consumption**



In staff's commercial building sector forecasting model, floorspace by building type, (retail, offices, schools, for example) is the key driver of commercial consumption. Figure 8-9 provides a comparison of total commercial floorspace projections. For the Other planning area the CED 2006 floorspace projections are slightly higher than the CED 2003 floorspace projections.

**Figure 8-9: Other Planning Area Commercial Floorspace**



## Industrial Sector

Figure 8-10 provides comparisons of the Other planning area industrial sector electricity consumption forecasts. The CED 2006 industrial electricity consumption forecast is slightly higher throughout the entire forecast period than the CED 2003 forecast. This is primarily due to a higher starting point of the CED 2006 forecast. The growth rate of both forecasts is relatively constant.

**Figure 8-10: Other Planning Area Industrial Consumption**

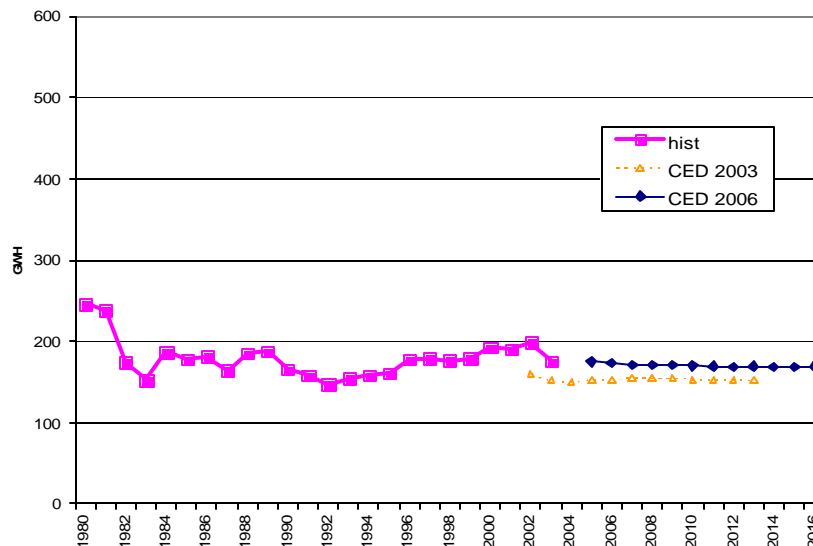
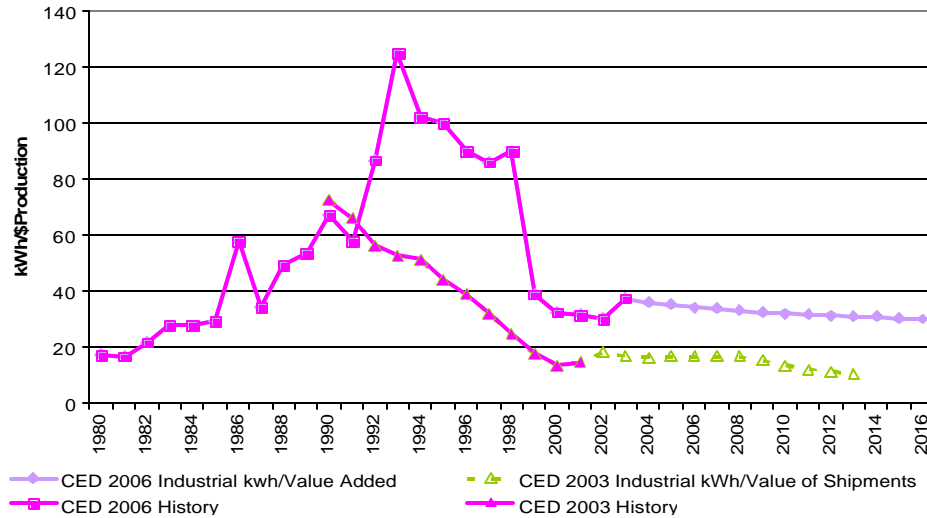


Figure 8-11 provides a comparison of use per dollar value of production between the CED 2006 and CED 2003 forecasts. The CED 2003 forecast used value of shipments provided by the UCLA Anderson School of Business. The CED 2006 forecast uses value added provided by the October, 2004 Economy.com projections. Staff switched to economy.com for its economic projections because the economic drivers are provided at county and MSA levels of disaggregation. It is apparent from the historic county level economic drivers that there are major differences in economic activity in the various regions of California. This enables the CED 2006 forecast to assume different patterns of economic activity in the separate utility planning areas. The UCLA forecast is only provided at a statewide level. Translation of these to individual regions was not considered critical during the hiatus in formal planning prior to enactment of SB 1389 and thus for the CED 2003 energy forecasts, economic projections grew at the same rate for all parts of the state. With the resumption of planning area based energy assessments in this 2005 *Energy Report* cycle, staff shifted back to preparation of economic/demographic projections tailored to the various sub-regions of the state.

kWh per dollar of industrial value added in the CED 2006 industrial forecast is projected to decline slightly over the forecast period, similar to the pattern projected in the CED 2003 forecast.

**Figure 8-11: Other Planning Area  
Industrial Use per Production Unit**



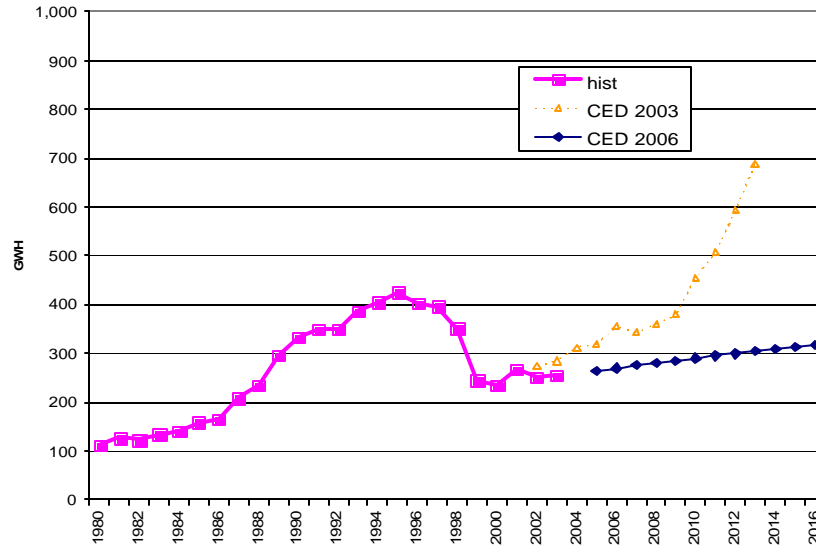
## Other Sectors

Figures 8-12 and 8-13 provide comparisons of the remaining sector electricity consumption forecasts. Figure 8-12 provides a comparison of the transportation, communication and utilities (TCU) sector forecasts. The CED 2006 TCU forecast is lower than the CED 2003 forecast and grows at a lower rate due to a lower projected rate of population growth. Because of lack of accurate historic information the TCU sector was forecasted at a sector level driven by population rather than at a specific industry level as in the previous forecast. Figure 8-13 provides comparisons of the agriculture and water pumping (ag & water pumping) and mining and oil extraction sector forecasts. The CED 2006 ag & water pumping forecast is slightly higher than the CED 2003 forecast due to a higher starting point. The growth rates of the two forecast are similar. The CED 2006 mining and oil extraction forecast is essentially the same as the CED 2006 mining and oil extraction forecast.

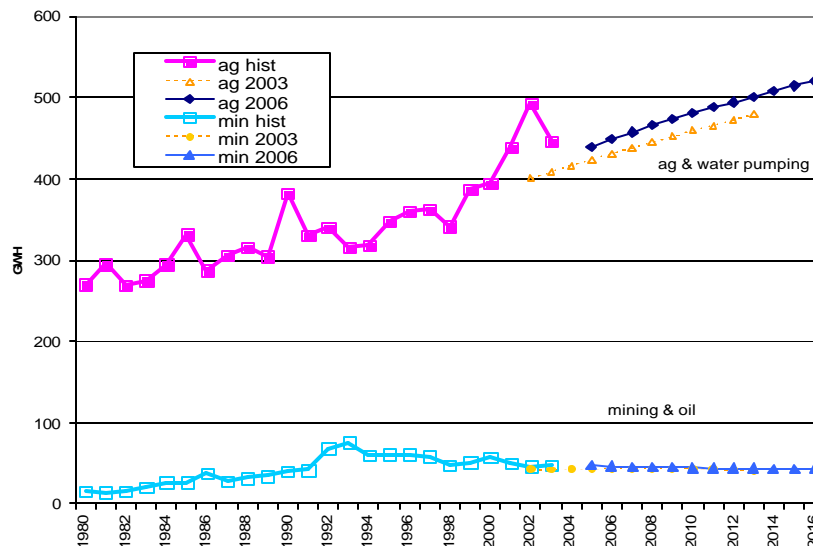
## Electricity Prices

Electricity prices for the Other planning area forecast were held constant at 2004 levels by sector for the entire forecast period.

**Figure 8-12: Other Planning Area  
Transportation, Communication & Utilities Sector  
Electricity Consumption**



**Figure 8-13: Other Planning Area  
Agriculture & Water Pumping and Mining & Oil Extraction  
Electricity Consumption Forecasts**



**Form 1.1 - OTHER**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Electricity Consumption by Sector (GWh)**

Year	Residential	Commercial	Industrial	Mining	Agricultural	TCU	Streetlighting	Total Consumption
1980	1,253	780	246	15	270	109	3	2,677
1981	1,282	823	239	15	295	123	4	2,781
1982	1,253	826	174	15	269	112	11	2,660
1983	1,221	792	153	21	275	124	10	2,595
1984	1,257	817	187	27	295	130	10	2,722
1985	1,235	839	178	27	332	150	9	2,770
1986	1,218	867	182	38	288	159	6	2,758
1987	1,272	894	164	28	305	203	6	2,872
1988	1,349	937	185	32	316	229	6	3,055
1989	1,418	963	188	35	304	291	5	3,205
1990	1,414	973	166	41	382	326	7	3,310
1991	1,443	1,000	159	42	330	342	7	3,323
1992	1,526	1,081	147	68	341	340	10	3,513
1993	1,545	1,126	154	75	315	376	10	3,602
1994	1,618	1,199	158	60	318	395	10	3,758
1995	1,606	1,218	161	61	348	419	6	3,819
1996	1,772	1,216	178	61	361	394	8	3,989
1997	1,721	1,263	179	59	362	388	8	3,980
1998	1,685	1,316	177	48	341	341	10	3,919
1999	1,802	1,353	179	51	387	235	10	4,017
2000	1,917	1,439	193	57	395	225	10	4,236
2001	1,908	1,547	191	50	439	255	12	4,402
2002	1,956	1,612	199	46	494	238	13	4,557
2003	1,979	1,592	175	48	446	243	11	4,495
2006	2,090	1,683	172	47	449	258	12	4,710
2007	2,127	1,699	171	46	458	263	12	4,776
2008	2,164	1,706	171	46	466	268	12	4,833
2009	2,202	1,716	170	45	474	273	12	4,892
2010	2,241	1,729	169	45	481	278	12	4,955
2011	2,280	1,745	169	44	488	282	12	5,021
2012	2,320	1,751	169	44	495	287	12	5,078
2013	2,360	1,765	169	44	501	291	13	5,143
2014	2,400	1,769	169	44	508	296	13	5,199
2015	2,441	1,780	170	43	515	300	13	5,262
2016	2,483	1,791	170	43	521	304	13	5,326

**Annual Growth Rates (%)**

1980-1990	1.2	2.2	-3.8	10.3	3.5	11.5	7.4	2.1
1990-2000	3.1	4.0	1.5	3.5	0.3	-3.6	3.8	2.5
2000-2003	1.1	3.4	-3.3	-5.9	4.1	2.6	4.1	2.0
2003-2008	1.8	1.4	-0.5	-0.8	0.9	1.9	1.3	1.5
2008-2016	1.7	0.6	-0.1	-0.7	1.4	1.6	1.0	1.2
2003-2016	1.8	0.9	-0.2	-0.7	1.2	1.7	1.1	1.3

**Form 1.2 - Other**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Net Energy for Load (GWh)**

Year	Total Consumption	Net Losses	Gross Generation	Private Supply	Net Energy for Load
1980	2,677	343	3,020	0	3,020
1981	2,781	356	3,137	0	3,137
1982	2,660	341	3,001	0	3,001
1983	2,595	332	2,928	0	2,928
1984	2,722	348	3,071	0	3,071
1985	2,770	355	3,124	0	3,124
1986	2,758	353	3,111	0	3,111
1987	2,872	368	3,240	0	3,240
1988	3,055	391	3,446	0	3,446
1989	3,205	410	3,615	0	3,615
1990	3,310	424	3,733	0	3,733
1991	3,323	425	3,748	0	3,748
1992	3,513	450	3,963	0	3,963
1993	3,602	461	4,063	0	4,063
1994	3,758	481	4,239	0	4,239
1995	3,819	489	4,308	0	4,308
1996	3,989	511	4,499	0	4,499
1997	3,980	509	4,489	0	4,489
1998	3,919	502	4,421	0	4,421
1999	4,017	514	4,531	0	4,531
2000	4,236	542	4,779	0	4,779
2001	4,402	563	4,966	0	4,966
2002	4,557	583	5,140	0	5,140
2003	4,495	575	5,070	0	5,070
2006	4,710	603	5,313	0	5,313
2007	4,776	611	5,388	0	5,388
2008	4,833	619	5,452	0	5,452
2009	4,892	626	5,518	0	5,518
2010	4,955	634	5,589	0	5,589
2011	5,021	643	5,664	0	5,664
2012	5,078	650	5,728	0	5,728
2013	5,143	658	5,802	0	5,802
2014	5,199	665	5,864	0	5,864
2015	5,262	674	5,935	0	5,935
2016	5,326	682	6,008	0	6,008

**Annual Growth Rates (%)**

1980-1990	2.1	2.1	2.1	2.1
1990-2000	2.5	2.5	2.5	2.5
2000-2003	2.0	2.0	2.0	2.0
2003-2008	1.5	1.5	1.5	1.5
2008-2016	1.3	1.3	1.3	1.3
2003-2016	1.4	1.4	1.4	1.4

**Form 1.4 - Other Planning Area**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Peak Demand (MW)**

Year	Total End Use Load	Net Losses	Gross Generation	Private Supply	Net Peak Demand	Load Factor (%)
1980	611	37	648	0	648	53.2
1981	635	38	673	0	673	53.2
1982	607	36	644	0	644	53.2
1983	593	36	628	0	628	53.2
1984	622	37	659	0	659	53.2
1985	632	38	670	0	670	53.2
1986	630	38	668	0	668	53.2
1987	656	39	695	0	695	53.2
1988	698	42	739	0	739	53.2
1989	732	44	776	0	776	53.2
1990	756	45	801	0	801	53.2
1991	759	46	804	0	804	53.2
1992	802	48	850	0	850	53.2
1993	822	49	872	0	872	53.2
1994	858	51	909	0	909	53.2
1995	872	52	924	0	924	53.2
1996	911	55	965	0	965	53.2
1997	909	55	963	0	963	53.2
1998	895	54	949	0	949	53.2
1999	917	55	972	0	972	53.2
2000	967	58	1,025	0	1,025	53.2
2001	1,011	61	1,071	0	1,071	52.9
2002	1,051	63	1,115	0	1,115	52.7
2003	1,079	65	1,144	0	1,144	50.6
2004	1,100	66	1,166	0	1,166	50.6
2006	1,131	68	1,199	0	1,199	50.6
2007	1,147	69	1,216	0	1,216	50.6
2008	1,161	70	1,230	0	1,230	50.6
2009	1,175	71	1,246	0	1,246	50.6
2010	1,190	71	1,262	0	1,262	50.6
2011	1,206	72	1,279	0	1,279	50.6
2012	1,220	73	1,293	0	1,293	50.6
2013	1,236	74	1,310	0	1,310	50.6
2014	1,249	75	1,324	0	1,324	50.6
2015	1,264	76	1,340	0	1,340	50.5
2016	1,280	77	1,357	0	1,357	50.5

**Annual Growth Rates (%)**

1990-2000	2.5	2.5	2.5	2.5
2000-2001	4.5	4.5	4.5	4.5
2000-2003	3.7	3.7	3.7	3.7
2003-2008	1.5	1.5	1.5	1.5
2008-2016	1.2	1.2	1.2	1.2
2003-2016	1.3	1.3	1.3	1.3



**Form 1.5 - OTHER**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Noncoincident Peak Demand Temperature Scenarios**

Year	1-in-2 Temperatures	1-in-5 Temperatures	1-in-10 Temperatures	1-in-20 Temperatures	1-in-5 Multiplier	1-in-10 Multiplier	1-in-20 Multiplier
2006	1,199	1,251	1,283	1,305	1.043	1.070	1.088
2007	1,216	1,269	1,301	1,323	1.043	1.070	1.088
2008	1,230	1,284	1,317	1,339	1.043	1.070	1.088
2009	1,246	1,300	1,333	1,355	1.043	1.070	1.088
2010	1,262	1,316	1,350	1,373	1.043	1.070	1.088
2011	1,279	1,334	1,368	1,391	1.043	1.070	1.088
2012	1,293	1,349	1,384	1,407	1.043	1.070	1.088
2013	1,310	1,367	1,402	1,425	1.043	1.070	1.088
2014	1,324	1,382	1,417	1,441	1.043	1.070	1.088
2015	1,340	1,398	1,434	1,458	1.043	1.070	1.088
2016	1,357	1,416	1,452	1,476	1.043	1.070	1.088

**Form 2.3a - Other Planning Area**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Electricity Rate Forecast (2003 cents/kwh)**

Year	GDP Implicit Price Deflator	Residential	Commercial	Industrial	Agriculture
1990	75.49				
1991	78.13				
1992	79.92				
1993	81.77				
1994	83.51				
1995	85.22				
1996	86.83				
1997	88.28				
1998	89.26				
1999	90.54				
2000	92.52				
2001	94.74				
2002	96.31				
2003	98.07				
2004	100.00	11.40			9.30
2005	101.51	11.40	11.10	11.10	9.30
2006	103.64	11.40	11.10	11.10	9.30
2007	105.58	11.40	11.10	11.10	9.30
2008	107.36	11.40	11.10	11.10	9.30
2009	109.26	11.40	11.10	11.10	9.30
2010	111.24	11.40	11.10	11.10	9.30
2011	113.25	11.40	11.10	11.10	9.30
2012	115.23	11.40	11.10	11.10	9.30
2013	117.23	11.40	11.10	11.10	9.30
2014	119.25	11.40	11.10	11.10	9.30
2015	121.31	11.40	11.10	11.10	9.30
2016	123.42	11.40	11.10	11.10	9.30

**Annual Growth Rates (%)**

1990-2000	2.1
2000-2001	2.4
2000-2003	2.0
2003-2008	1.8
2008-2016	1.8
2003-2016	1.8

**Form 2.2 - Other Planning Area**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Planning Area Economic and Demographic Assumptions**

Year	Population	Households	Persons per Household	Per Capita Income (2003\$)	Industrial Value Added (Millions 2003\$)
1980	279,043	99,379	2.808	15,978	881
1981	283,517	101,440	2.795	16,037	866
1982	287,332	102,860	2.793	17,485	700
1983	295,609	105,165	2.811	18,510	770
1984	303,750	108,203	2.807	18,154	959
1985	311,143	110,849	2.807	18,115	925
1986	319,996	114,138	2.804	19,170	663
1987	328,088	117,058	2.803	18,828	819
1988	341,568	121,588	2.809	19,416	655
1989	350,716	125,288	2.799	21,019	647
1990	359,987	127,492	2.824	20,008	605
1991	373,727	130,963	2.854	19,317	735
1992	384,251	133,591	2.876	19,164	788
1993	392,781	135,633	2.896	19,504	605
1994	395,922	137,561	2.878	20,205	586
1995	398,714	139,325	2.862	20,303	616
1996	402,487	140,649	2.862	20,690	678
1997	409,112	142,505	2.871	21,392	684
1998	411,461	144,572	2.846	22,086	538
1999	417,837	146,890	2.845	22,357	1,315
2000	425,921	149,039	2.858	22,201	1,772
2001	437,370	151,583	2.885	21,237	1,595
2002	448,427	154,988	2.893	21,014	1,548
2003	458,502	158,419	2.894	21,159	1,279
2004	467,876	161,385	2.899	21,082	1,343
2005	477,200	164,324	2.904	21,170	1,366
2006	486,477	167,237	2.909	21,174	1,367
2007	495,711	170,125	2.914	21,817	1,375
2008	504,898	172,987	2.919	23,214	1,387
2009	514,031	175,820	2.924	23,698	1,393
2010	523,057	178,602	2.929	23,756	1,398
2011	531,559	181,188	2.934	24,027	1,405
2012	540,009	183,746	2.939	24,325	1,414
2013	548,392	186,270	2.944	24,700	1,419
2014	556,727	188,768	2.949	25,154	1,423
2015	565,001	191,234	2.955	25,501	1,434
2016	573,217	193,670	2.960	25,753	1,444

**Annual Growth Rates (%)**

1990-2000	1.7	1.6	0.1	1.0	11.3
2000-2001	2.7	1.7	1.0	-4.3	-10.0
2000-2003	2.5	2.1	0.4	-1.6	-10.3
2003-2008	1.9	1.8	0.2	1.9	1.6
2008-2016	1.6	1.4	0.2	1.3	0.5
2003-2016	1.7	1.6	0.2	1.5	0.9

# CHAPTER 9

## DWR PLANNING AREA

The California Department of Water Resources (DWR) planning area is defined as the pumping operations of the State Water Project. This pumping is required to deliver water from the Delta in northern California to other parts of the state.

### Forecast Results

Table 9-1 presents a comparison of electricity consumption and peak demand for selected years. Due to lack of specific forecast information the forecast for the DWR planning area was held constant at the 2003 level for both electricity consumption and peak. DWR pumping load has increased over the last few years because of dry winters and decreases in water supply from other sources such as the Colorado River. It is anticipated that the State Water Project will continue to operate at this higher level of energy use as more population and economic growth occur in the southern part of the state.

**Table 9-1: DWR Planning Area Forecast Comparison**

	Consumption (GWH)				Peak (MW)		
	CED 2003	CED 2006	%difference		CED 2003	CED 2006	%difference
1990	8,171	8,171	0.00%		241	250	3.75%
2000	5,490	5,490	0.00%		250	250	0.00%
2003	7,889	8,865	12.37%		341	840	146.37%
2008	7,889	8,865	12.37%		341	840	146.37%
2013	7,889	8,865	12.37%		341	840	146.37%
2016	n/a	8,865			n/a	840	
Annual Average Growth Rates							
1990-2000	-3.90%	-3.90%			0.37%	0.00%	
2000-2003	12.85%	17.32%			10.90%	49.78%	
2003-2008	0.00%	0.00%			0.00%	0.00%	
2003-2013	0.00%	0.00%			0.00%	0.00%	
Historic values are shaded							

**Form 1.1 - DWR**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Electricity Consumption by Sector (GWh)**

Year	Residential	Commercial	Industrial	Mining	Agricultural	TCU	Streetlighting	Total Consumption
1980					3,354			3,354
1981					5,264			5,264
1982					5,192			5,192
1983					2,497			2,497
1984					3,349			3,349
1985					5,410			5,410
1986					5,031			5,031
1987					4,734			4,734
1988					5,928			5,928
1989					7,413			7,413
1990					8,171			8,171
1991					4,400			4,400
1992					4,088			4,088
1993					4,372			4,372
1994					4,946			4,946
1995					3,562			3,562
1996					5,146			5,146
1997					5,504			5,504
1998					3,421			3,421
1999					5,490			5,490
2000					5,490			5,490
2001					6,349			6,349
2002					8,181			8,181
2003					8,865			8,865
2006					8,865			8,865
2007					8,865			8,865
2008					8,865			8,865
2009					8,865			8,865
2010					8,865			8,865
2011					8,865			8,865
2012					8,865			8,865
2013					8,865			8,865
2014					8,865			8,865
2015					8,865			8,865
2016					8,865			8,865

**Annual Growth Rates (%)**

1980-1990

1990-2000

2000-2003

2003-2008

2008-2016

2003-2016

0.0

0.0

**Form 1.2 - DWR**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Net Energy for Load (GWh)**

Year	Total Consumption	Net Losses	Gross Generation	Private Supply	Net Energy for Load
1980	3,354	127	3,481	0	3,481
1981	5,264	200	5,464	0	5,464
1982	5,192	197	5,389	0	5,389
1983	2,497	95	2,592	0	2,592
1984	3,349	127	3,476	0	3,476
1985	5,410	206	5,616	0	5,616
1986	5,031	191	5,222	0	5,222
1987	4,734	180	4,913	0	4,913
1988	5,928	225	6,154	0	6,154
1989	7,413	282	7,694	0	7,694
1990	8,171	311	8,482	0	8,482
1991	4,400	167	4,567	0	4,567
1992	4,088	155	4,243	0	4,243
1993	4,372	166	4,538	0	4,538
1994	4,946	188	5,133	0	5,133
1995	3,562	135	3,698	0	3,698
1996	5,146	196	5,342	0	5,342
1997	5,504	209	5,713	0	5,713
1998	3,421	130	3,551	0	3,551
1999	5,490	209	5,699	0	5,699
2000	5,490	209	5,699	0	5,699
2001	6,349	269	6,619	0	6,619
2002	8,181	347	8,528	0	8,528
2003	8,865	376	9,241	0	9,241
2006	8,865	376	9,241	0	9,241
2007	8,865	376	9,241	0	9,241
2008	8,865	376	9,241	0	9,241
2009	8,865	376	9,241	0	9,241
2010	8,865	376	9,241	0	9,241
2011	8,865	376	9,241	0	9,241
2012	8,865	376	9,241	0	9,241
2013	8,865	376	9,241	0	9,241
2014	8,865	376	9,241	0	9,241
2015	8,865	376	9,241	0	9,241
2016	8,865	376	9,241	0	9,241

**Annual Growth Rates (%)**

1980-1990	9.3	9.3	9.3	9.3
1990-2000	-3.9	-3.9	-3.9	-3.9
2000-2003	17.3	21.7	17.5	17.5
2003-2006	0.0	0.0	0.0	0.0
2006-2010	0.0	0.0	0.0	0.0
2010-2016	0.0	0.0	0.0	0.0

**Form 1.4 - DWR**  
**California Energy Demand 2006-2016 Staff Forecast**  
**Peak Demand (MW)**

Year	Total End Use Load	Net Losses	Gross Generation	Private Supply	Net Peak Demand
1980	227	14	241		241
1981	375	22	397		397
1982	242	14	256		256
1983	208	12	220		220
1984	88	5	93		93
1985	236	14	250		250
1986	398	24	422		422
1987	237	14	251		251
1988	236	14	250		250
1989	236	14	250		250
1990	227	14	241		250
1991	375	22	397		397
1992	242	14	256		256
1993	208	12	220		220
1994	88	5	93		93
1995	236	14	250		250
1996	398	24	422		422
1997	237	14	251		251
1998	236	14	250		250
1999	236	14	250		250
2000	236	14	250		250
2001	124	7	131		131
2002	731	44	775		775
2003	792	48	840		840
2004	792	48	840		840
2006	792	48	840		840
2007	792	48	840		840
2008	792	48	840		840
2009	792	48	840		840
2010	792	48	840		840
2011	792	48	840		840
2012	792	48	840		840
2013	792	48	840		840
2014	792	48	840		840
2015	792	48	840		840
2016	792	48	840		840
2000-2003	49.8	49.8	49.8		49.8
2003-2008	0.0	0.0	0.0		0.0
2008-2016	0.0	0.0	0.0		0.0
2003-2016	0.0	0.0	0.0		0.0

# CHAPTER 10

## NATURAL GAS DEMAND FORECAST

This chapter presents the staff CED 2006 forecasts of end user natural gas demand, for the state and for the PG&E, SCG, and SDG&E natural gas planning areas. Staff prepares these forecasts in parallel with its electricity demand forecasts. The models used by staff are organized along electricity planning area boundaries. The gas demand forecasts presented here are the aggregate of gas demand in the corresponding electricity planning areas. These forecasts do not include natural gas used by utilities or others for electric generation.

### Forecast Results

Table 10-1 compares the statewide CED 2006 forecast with CED 2003 for selected years. Overall the forecast is lower, primarily because recorded 2003 consumption was almost 4.5 percent lower than forecast in CED 2003. This difference largely reflects lower usage by Northern California refineries beginning in 2002, and the effects of higher natural gas prices on demand. Because of lower population growth and higher forecasted natural gas prices, the difference between the two forecasts continues to grow; by 2013 the staff CED 2006 forecast is more than 6 percent lower than the CED 2003 forecast.

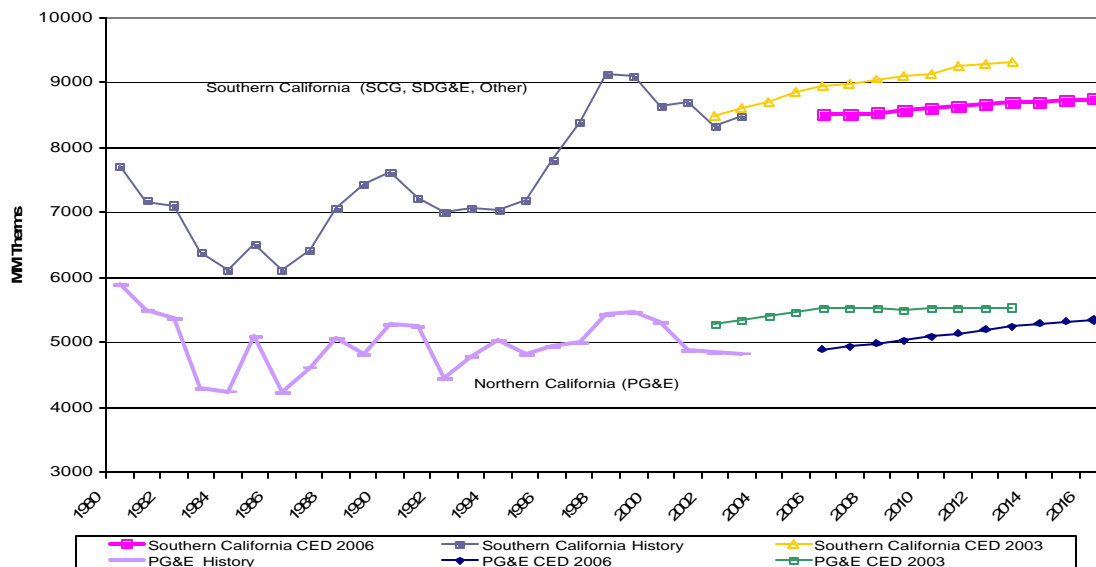
**Table 10-1: Statewide Natural Gas Forecast Comparison**

	Consumption (MM Therms)		
	CED 2003	CED 2006	Percent Difference
1990	12,695	12,893	1.56%
2000	13,964	13,931	-0.24%
2003	13,940	13,317	-4.47%
2008	14,580	13,517	-7.29%
2013	14,852	13,935	-6.17%
2016	n/a	14,091	
Annual Average Growth Rates			
1990-2000	0.96%	0.78%	
2000-2003	-0.06%	-1.49%	
2003-2008	0.90%	0.30%	
2003-2013	0.64%	0.45%	
Historic values are shaded			



Figure 10-1 compares the forecast by region. Demand in 2003 was about 1.5 percent lower than forecast in Southern California. In PG&E, 2003 gas use was 9.5 percent lower than previously forecast.

**Figure 10-1**  
**Natural Gas Demand Forecast**



**Figure 10-2**  
**Statewide Per Capita Natural Gas Consumption**

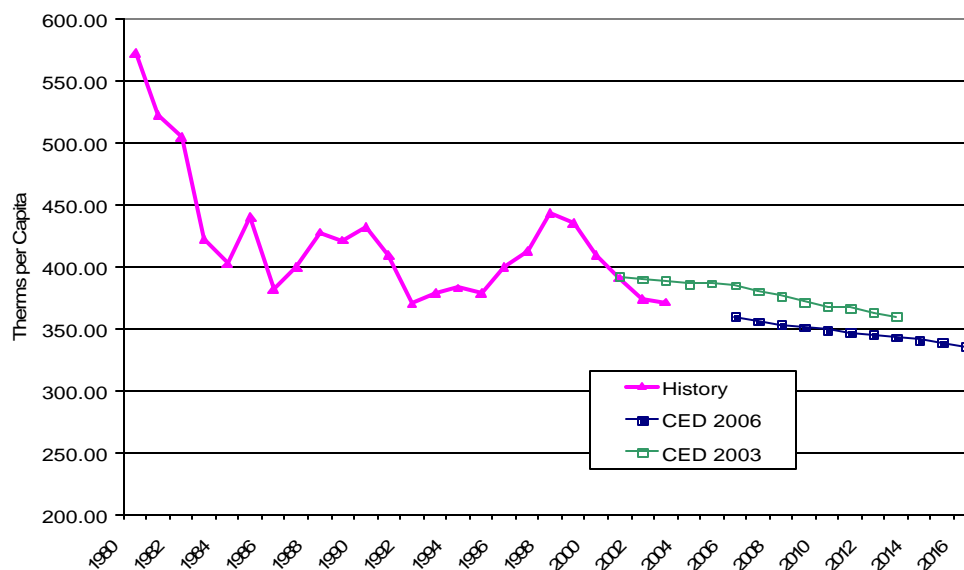
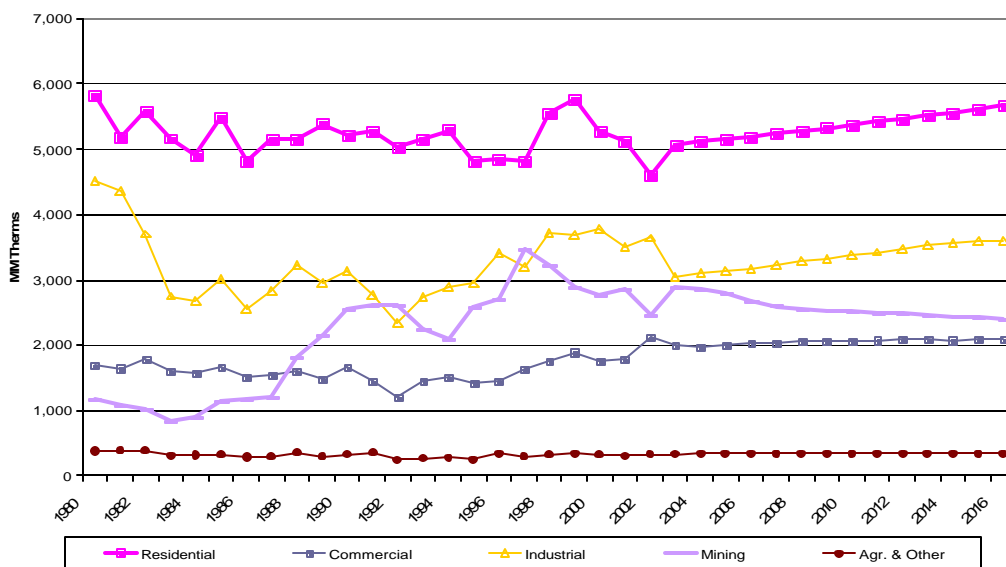


Figure 10-2 compares the old and new per capita natural gas consumption forecasts. Annual per capita demand varies in response to annual temperatures and business conditions, but has generally been declining over time. Projected per capita consumption in the CED 2006 forecast is lower than that projected in the CED 2003 forecast. This is due to reduced consumption levels resulting from higher gas prices than were previously anticipated. Both forecasts project a steady decline in per capita consumption over the forecast period.

Figure 10-3 shows the statewide forecast by major economic sector. Residential gas demand, which constitutes more than a third of total end user gas demand, is forecasted to grow at less than one percent annually. After several years of declines reflecting the Bay Area recession and rising natural gas prices, industrial natural gas demand is forecasted to grow at about 1.4 percent annually. Demand in the mining industry, which is largely oil and natural gas extraction, is expected to fall as production from California's mature oil fields continues to decline. Demand in the less gas intensive commercial and other sectors grows at less than one half percent annually. The effects of building standards slow both residential and commercial demand growth.

**Figure 10-3: Statewide Natural Gas Demand by Sector**



## Planning Area Results

### *Pacific Gas and Electric Planning Area*

The PG&E natural gas planning area is defined as the combined PG&E and SMUD electric planning areas. It includes all PG&E retail gas customers, and customers of private marketers using the PG&E natural gas distribution system.

Table 10-2 compares the PG&E planning area forecasts. Demand in 2003 was more than nine percent lower than forecast in CED 2003. Much of this is a decline in natural gas used for petroleum refining. Residential demand in 2003 was four percent below forecast, and commercial, TCU, and agricultural demand together were six percent below forecast. The difference between the forecasts declines over time with stronger economic and population growth in the Sacramento region than projected in CED 2003.

**Table 10-2: PG&E Natural Gas Forecast Comparison**

	Consumption (MM Therms)		
	CED 2003	CED 2006	%difference
1990	5,278	5,275	-0.06%
2000	5,339	5,308	-0.59%
2003	5,344	4,838	-9.47%
2008	5,531	4,990	-9.79%
2013	5,545	5,252	-5.28%
2016	n/a	5,350	
Annual Average Growth Rates			
1990-2000	0.12%	0.06%	
2000-2003	0.03%	-3.04%	
2003-2008	0.69%	0.62%	
2003-2013	0.37%	0.82%	
Historic values are shaded			

Figure 10-4 compares the CED 2006 and CED 2003 PG&E planning area residential forecasts. The CED 2006 forecast is lower throughout the entire forecast period. The short-term difference is caused by lower per capita consumption than projected in the CED 2003 forecast, in response to higher natural gas prices. This difference decreases over time because the CED 2006 economic and demographic projections for the SMUD planning area grow at a faster rate than the previous forecast.

**Figure 10-4: PG&E Planning Area Residential Consumption**



Figure 10-5 provides a comparison of the CED 2006 and CED 2003 nonresidential gas demand forecasts. While CED 2006 forecasts higher growth, averaging 1.3 percent annually in the industrial and commercial sectors, total nonresidential gas demand stays below 2000 levels throughout the forecast horizon.

**Figure 10-5  
PG&E Planning Area Nonresidential Gas Demand**

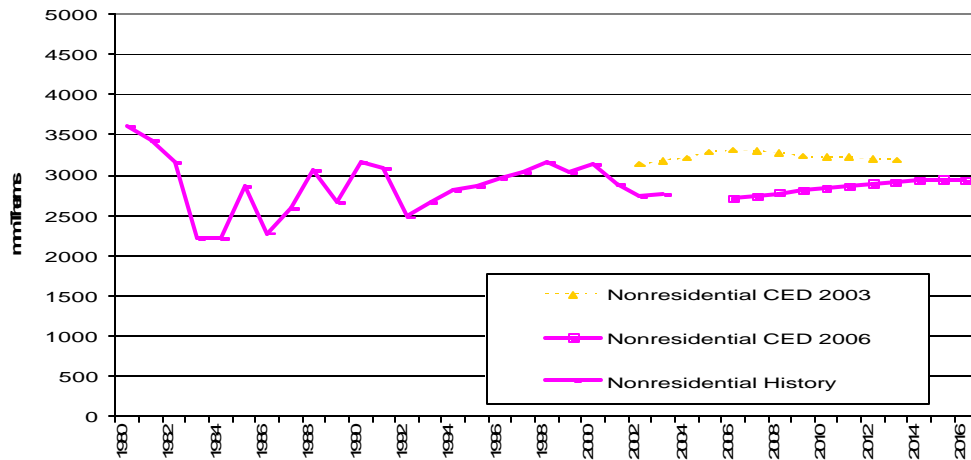
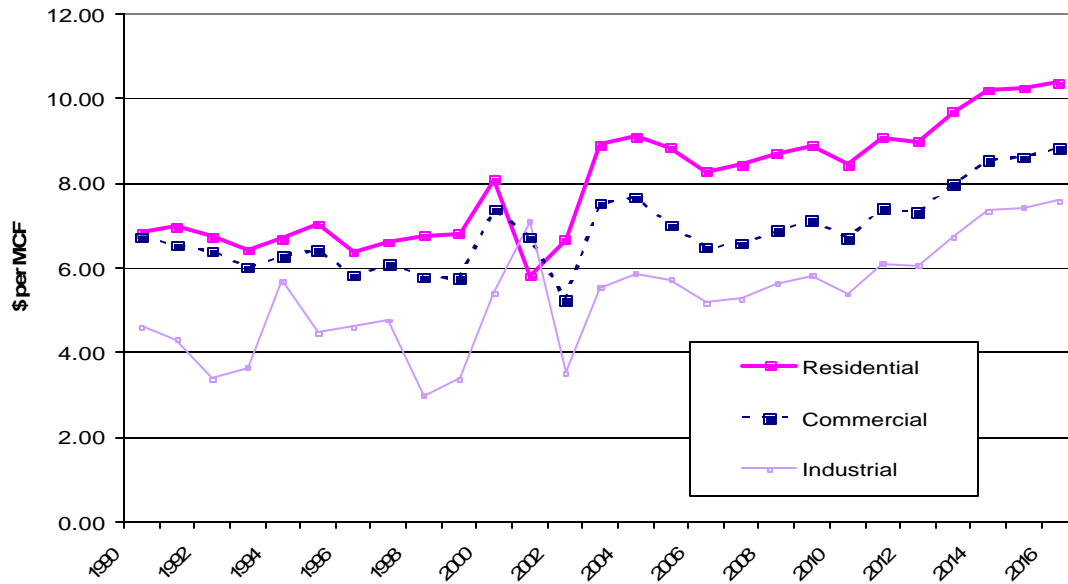


Figure 10-6 shows the gas prices forecasts developed by staff and used for the forecast. Prices to end users are projected to fluctuate around 2003 levels until after 2010, when they move sharply higher.

**Figure 10-6**  
**PG&E Natural Gas Price Forecast**



## ***Southern California Gas Company Planning Area***

The SCG planning area is comprised of the SCE, BGP, and LADWP electric planning areas. It includes customers of those utilities, plus customers of private marketers using the SCG natural gas distribution system.

Table 10-3 provides a comparison of the SCG planning area forecasts. The CED 2006 forecast is slightly lower in the short term due to a lower starting point than was projected in the CED 2003 forecast. Because of the effects of lower population and economic growth, and building standards, the growth rate of the CED 2006 forecast is lower than CED 2003.

**Table 10-3**  
**SCG Natural Gas Forecast Comparison**

	Consumption (MM Therms)		
	CED 2003	CED 2006	%difference
1990	6,806	6,806	0.00%
2000	7,939	7,939	0.00%
2003	7,907	7,814	-1.17%
2008	8,312	7,824	-5.87%
2013	8,535	7,944	-6.92%
2016	n/a	7,981	
Annual Average Growth Rates			
1990-2000	1.55%	1.55%	
2000-2003	-0.13%	-0.52%	
2003-2008	1.01%	0.03%	
2003-2013	0.77%	0.16%	
Historic values are shaded			

Figure 10-7 provides a comparison of the residential gas demand forecasts. The CED 2006 forecast is lower throughout the forecast period due to a higher gas prices. CED 2006 has a slightly lower growth rate, reflecting a slightly lower projection of number of households.

**Figure 10-7: SCG Planning Area Residential Natural Gas Consumption**

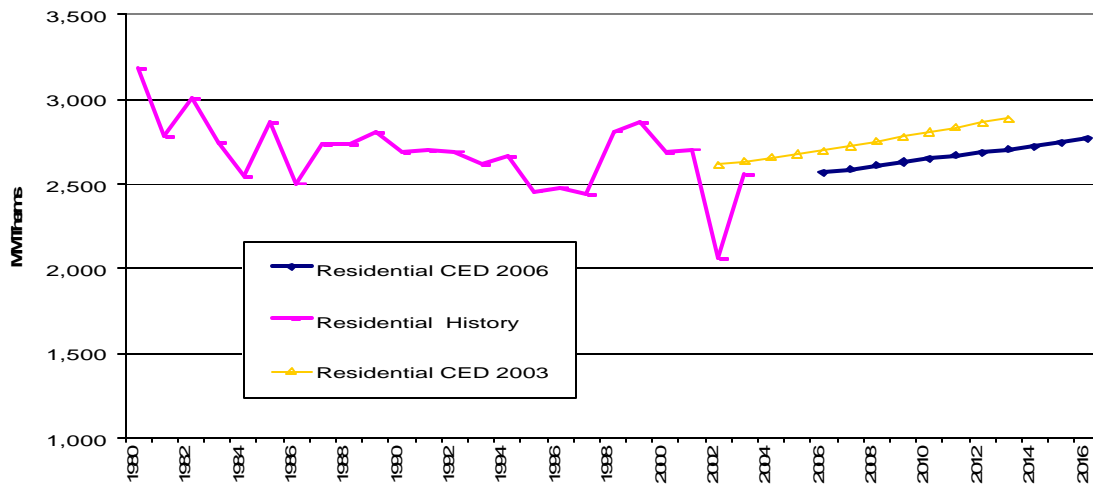
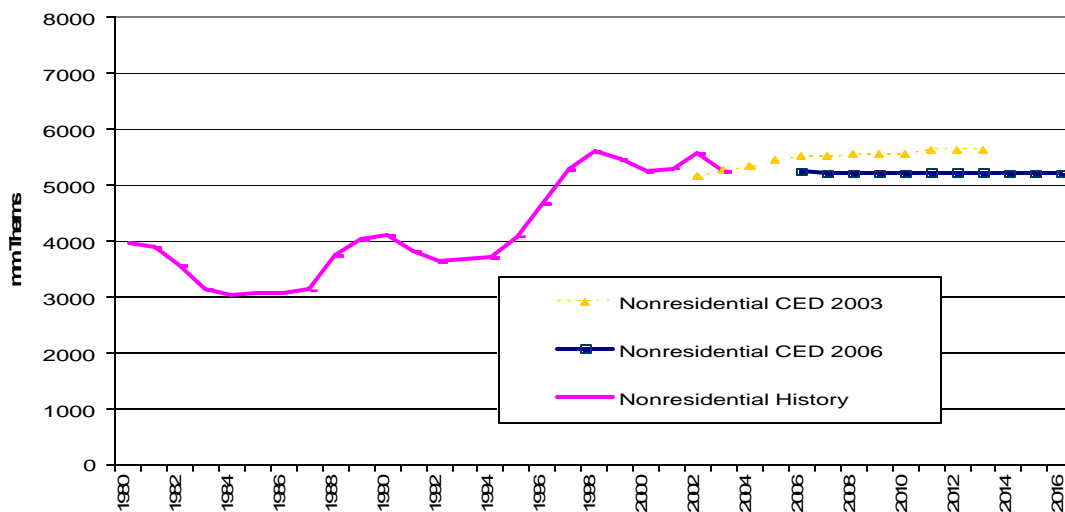
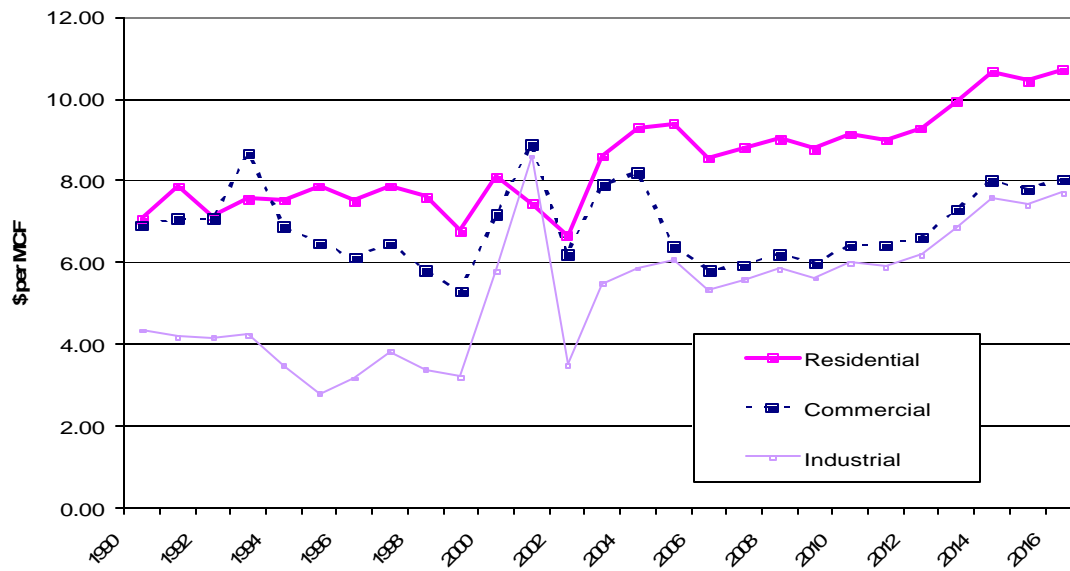


Figure 10-8 compares the nonresidential SCG forecasts. The CED 2006 nonresidential forecast is essentially flat in part because of declining demand forecasted in the mining sector. In CED 2003, natural gas demand from the mining sector increased slightly. The CED 2006 forecast uses the Economy.com employment projections as the economic driver for mining, which decline by an average of one percent annually in the SCG area. Continued high and rising natural gas prices, shown in **Figure 10-9**, also serve to dampen demand growth.

**Figure 10-8: SCG Planning Area Nonresidential Natural Gas Consumption**



**Figure 10-9: SCG Planning Area Natural Gas Price Forecast**





## ***San Diego Gas and Electric Planning Area***

The SDG&E planning area contains SDG&E customers, plus customers of private marketers using the SDG&E natural gas distribution system.

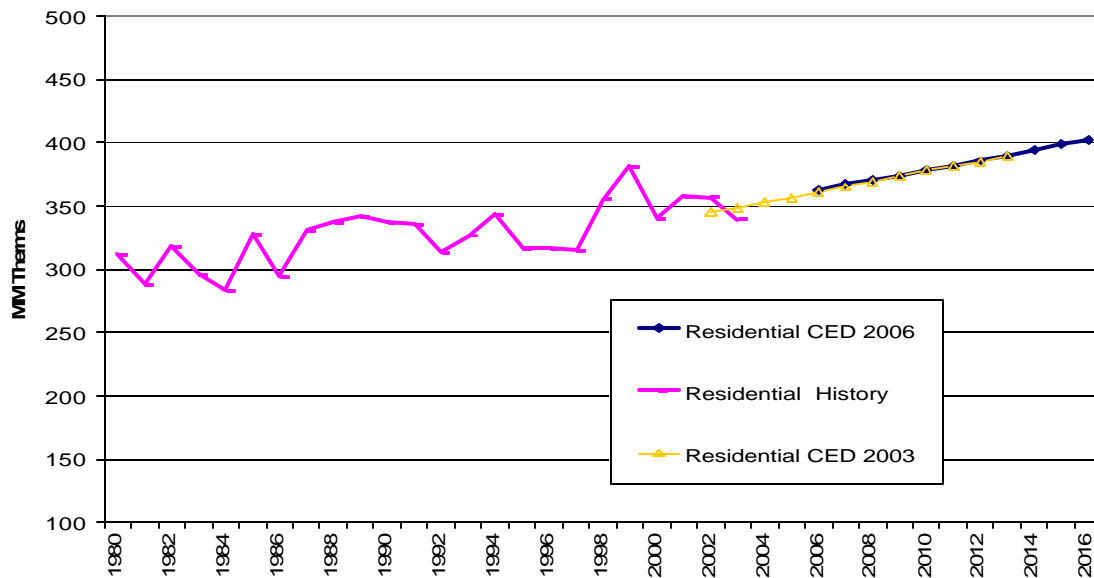
Table 10-4 provides a comparison of the SDG&E planning area forecasts. The CED 2006 forecast is lower in the short term due to a lower starting point than was projected in the CED 2003 forecast. Because of the effects of building standards and higher natural gas prices and, the growth rate of the CED 2006 forecast is slightly lower than CED 2003.

**Table 10-4: SDG&E Natural Gas Forecast Comparison**

	Consumption (MM Therms)		
	CED 2003	CED 2006	%difference
1990	517	517	0%
2000	567	566	-0.26%
2003	568	534	-5.99%
2008	611	568	-7.05%
2013	644	600	-6.92%
2016	n/a	619	
Annual Average Growth Rates			
1990-2000	0.94%	0.90%	
2000-2003	0.05%	-1.90%	
2003-2008	1.47%	1.24%	
2003-2013	1.27%	1.17%	

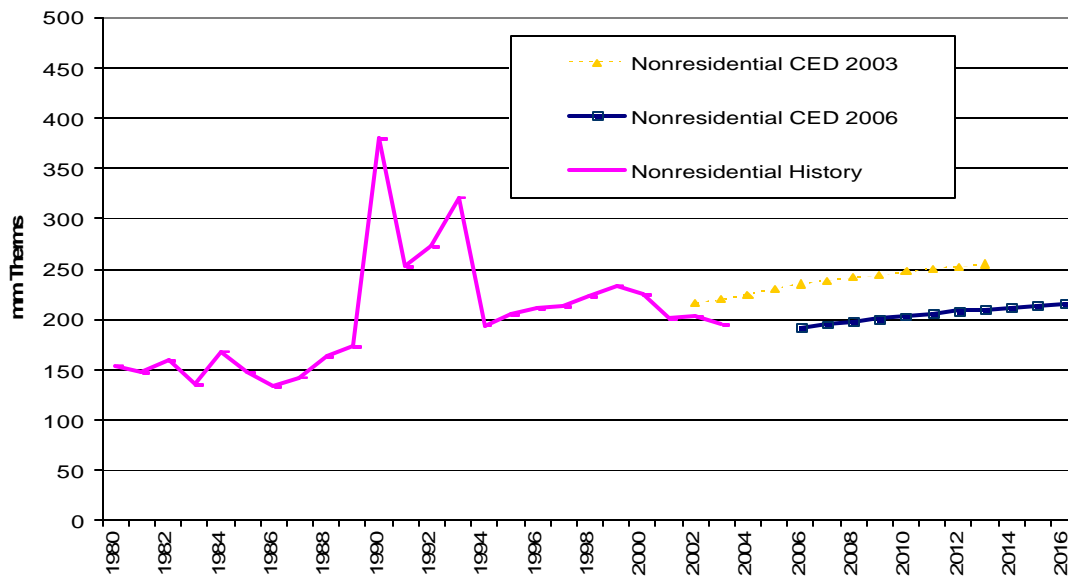
Figure 10-10 provides comparisons of the SDGE planning area residential gas consumption forecasts. The two forecasts are almost identical, as lower the effects of building standards and lower population growth are offset by higher per capita income.

**Figure 10-10: SDG&E Planning Area Residential Natural Gas Consumption**

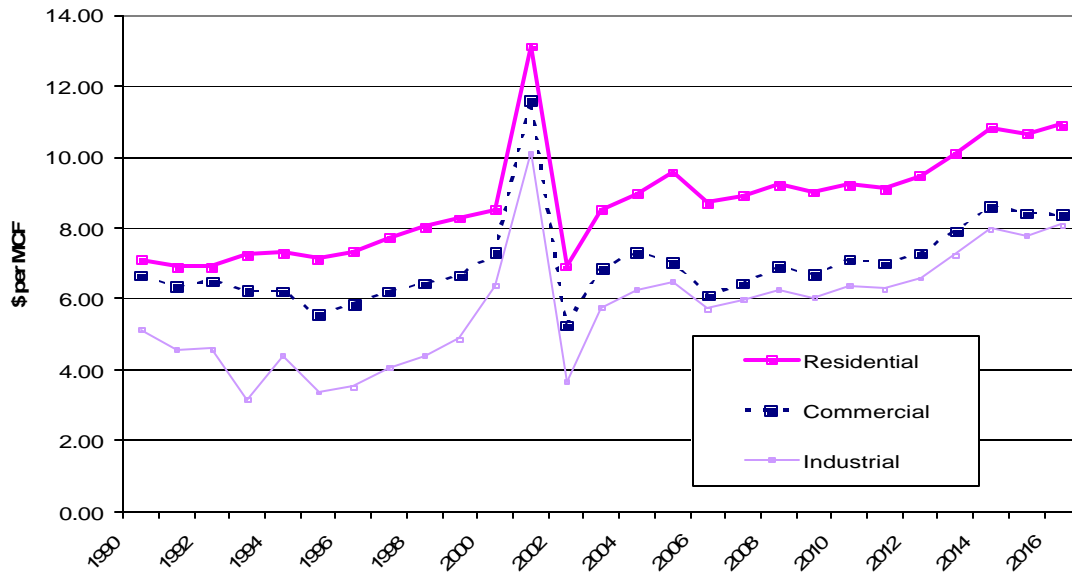


In the SDG&E nonresidential sector (Figure 10-11), the CED 2006 forecast starts lower, reflecting lower than forecast demand in 2003. This difference most likely is the result of higher than forecast natural gas prices. The CED 2006 forecast grows somewhat slower, because of rising natural gas prices, shown in Figure 10-12.

**Figure 10-11: SDG&E Planning Area Nonresidential Natural Gas Consumption**



**Figure 10-12: SDG&E Planning Area Prices**



**Table 10-5 - PG&E Planning Area  
California Energy Demand 2006-2016 Staff Forecast  
Natural Gas Consumption by Sector (10<sup>6</sup> Therms)**

	Residential	Commercial	Industrial	Mining	Agricultural	Other	Total Consumption
1980	2,298	712	2,464	250	73	113	5,909
1981	2,079	665	2,351	228	62	116	5,503
1982	2,226	736	2,029	215	58	122	5,385
1983	2,093	679	1,326	58	49	106	4,311
1984	2,036	677	1,316	74	48	106	4,256
1985	2,236	702	1,758	234	52	114	5,096
1986	1,958	630	1,413	89	46	101	4,237
1987	2,034	656	1,637	148	50	101	4,626
1988	2,015	738	1,895	207	56	159	5,070
1989	2,168	654	1,630	216	59	108	4,834
1990	2,118	778	1,962	238	65	114	5,275
1991	2,169	758	1,733	418	60	122	5,260
1992	1,963	651	1,530	162	50	90	4,445
1993	2,126	696	1,732	96	40	95	4,786
1994	2,211	755	1,840	71	52	98	5,027
1995	1,966	707	1,948	77	47	76	4,821
1996	1,982	706	2,080	44	55	81	4,948
1997	1,978	723	2,014	163	64	67	5,010
1998	2,283	789	1,914	319	70	67	5,442
1999	2,422	831	1,837	236	71	64	5,461
2000	2,180	797	1,909	288	79	55	5,308
2001	1,985	659	1,816	295	51	68	4,874
2002	2,110	825	1,547	272	59	35	4,848
2003	2,075	892	1,471	268	85	49	4,838
2006	2,177	818	1,502	259	87	49	4,892
2007	2,195	816	1,538	253	88	49	4,938
2008	2,214	813	1,577	249	88	49	4,990
2009	2,234	810	1,609	247	88	49	5,037
2010	2,255	811	1,646	247	89	49	5,096
2011	2,279	804	1,679	246	89	49	5,145
2012	2,304	801	1,715	245	89	49	5,203
2013	2,329	794	1,747	244	89	49	5,252
2014	2,354	787	1,774	243	89	49	5,296
2015	2,379	783	1,788	241	89	49	5,328
2016	2,404	778	1,793	237	89	49	5,350

**Annual Growth Rates (%)**

1980-1990	-0.8	0.9	-2.3	-0.5	-1.2	0.1	-1.1
1990-2000	0.3	0.2	-0.3	1.9	1.9	-6.9	0.1
2000-2001	-8.9	-17.4	-4.9	2.4	-34.8	23.3	-8.2
2000-2003	-1.6	3.8	-8.3	-2.3	2.5	-4.1	-3.0
2003-2008	1.3	-1.8	1.4	-1.5	0.8	0.0	0.6
2008-2016	1.0	-0.5	1.6	-0.6	0.1	0.0	0.9
2003-2016	1.1	-1.0	1.5	-1.0	0.4	0.0	0.8

**Table 10-6 - SCG Planning Area  
California Energy Demand 2006-2016 Staff Forecast  
Natural Gas Consumption by Sector (10<sup>6</sup> Therms)**

	Residential	Commercial	Industrial	Mining	Agricultural	Other	Total Consumption
1980	3,184	875	2,014	930	71	94	7,168
1981	2,784	883	1,973	854	80	102	6,676
1982	3,006	961	1,626	803	70	111	6,577
1983	2,747	825	1,398	790	50	88	5,898
1984	2,545	779	1,303	834	54	84	5,599
1985	2,870	841	1,208	910	53	83	5,965
1986	2,507	782	1,115	1,073	44	80	5,600
1987	2,740	792	1,164	1,058	44	78	5,875
1988	2,741	742	1,292	1,598	44	69	6,487
1989	2,806	725	1,276	1,927	41	64	6,838
1990	2,687	710	1,002	2,295	45	67	6,806
1991	2,705	543	954	2,194	34	109	6,539
1992	2,694	399	710	2,452	26	47	6,329
1993	2,620	559	899	2,153	33	58	6,322
1994	2,666	617	990	2,011	44	62	6,390
1995	2,459	578	919	2,494	40	67	6,557
1996	2,482	611	1,257	2,646	48	130	7,174
1997	2,441	709	1,132	3,311	63	87	7,743
1998	2,812	827	1,721	2,900	69	87	8,416
1999	2,870	905	1,757	2,635	87	92	8,347
2000	2,692	867	1,725	2,476	90	87	7,939
2001	2,707	960	1,637	2,556	86	74	8,021
2002	2,063	1,136	2,045	2,195	114	99	7,651
2003	2,558	939	1,529	2,608	102	77	7,814
2006	2,570	1,064	1,611	2,403	103	82	7,834
2007	2,589	1,074	1,628	2,340	103	82	7,815
2008	2,609	1,082	1,647	2,301	103	82	7,824
2009	2,630	1,097	1,661	2,279	103	82	7,851
2010	2,652	1,103	1,677	2,262	103	82	7,879
2011	2,669	1,116	1,691	2,246	103	82	7,906
2012	2,687	1,123	1,707	2,228	103	82	7,930
2013	2,705	1,126	1,721	2,208	103	82	7,944
2014	2,724	1,127	1,730	2,189	103	82	7,956
2015	2,745	1,138	1,738	2,170	103	82	7,977
2016	2,767	1,145	1,745	2,139	103	82	7,981

**Annual Growth Rates (%)**

1980-1990	-1.7	-2.1	-6.7	9.5	-4.4	-3.3	-0.5
1990-2000	0.0	2.0	5.6	0.8	7.2	2.7	1.6
2000-2001	0.6	10.7	-5.1	3.2	-4.7	-15.4	1.0
2000-2003	-1.7	2.7	-3.9	1.7	4.3	-4.3	-0.5
2003-2008	0.4	2.9	1.5	-2.5	0.1	1.3	0.0
2008-2016	0.7	0.7	0.7	-0.9	0.0	0.0	0.2
2003-2016	0.6	1.5	1.0	-1.5	0.1	0.5	0.2

**Table 10-7 - SDG&E Planning Area  
California Energy Demand 2006-2016 Staff Forecast  
Natural Gas Consumption by Sector (10<sup>6</sup> Therms)**

Year	Residential	Commercial	Industrial	Mining	Agricultural	Other	Total Consumption
1980	312	90	40	1	9	14	466
1981	288	86	39	1	8	14	436
1982	318	89	46	2	4	18	477
1983	296	88	27	2	5	13	432
1984	283	90	51	3	5	19	451
1985	327	89	36	3	4	15	474
1986	295	78	35	4	3	13	428
1987	331	78	43	5	4	14	473
1988	337	92	44	6	4	17	500
1989	342	92	52	7	4	18	515
1990	338	160	172	8	6	33	717
1991	335	136	82	6	5	23	588
1992	314	143	94	6	4	26	586
1993	327	174	104	5	8	30	648
1994	344	108	60	4	6	16	538
1995	316	118	62	4	6	16	521
1996	317	114	63	6	8	20	527
1997	316	173	29	1	3	7	528
1998	356	127	68	2	7	18	578
1999	382	136	68	2	8	20	616
2000	340	87	125	2	3	9	566
2001	358	139	35	2	6	18	559
2002	357	142	37	3	7	15	560
2003	340	140	31	6	5	13	534
2006	363	132	34	6	5	15	556
2007	367	134	34	6	5	15	562
2008	370	136	35	6	5	15	568
2009	374	138	36	7	5	15	575
2010	378	139	37	7	5	15	581
2011	382	141	38	7	5	15	588
2012	386	142	38	7	5	15	594
2013	390	143	39	8	5	15	600
2014	394	144	40	8	5	15	606
2015	398	146	40	8	5	15	612
2016	403	147	40	8	5	15	619

**Annual Growth Rates (%)**

1980-1990	0.8	5.8	15.7	22.9	-3.4	9.3	4.4
1990-2000	0.1	-5.8	-3.2	-13.5	-7.7	-12.6	-2.3
2000-2001	5.3	59.3	-71.9	19.4	110.1	106.9	-1.2
2000-2003	0.0	16.9	-37.2	44.0	22.8	14.6	-1.9
2003-2008	1.7	-0.6	2.8	2.0	0.1	3.0	1.2
2008-2016	1.1	1.0	1.6	3.5	0.0	0.0	1.1
2003-2016	1.3	0.4	2.0	2.9	0.0	1.2	1.1

**Table 10-8 - Other Planning Area  
California Energy Demand 2006-2016 Staff Forecast  
Natural Gas Consumption by Sector (10<sup>6</sup> Therms)**

Year	Residential	Commercial	Industrial	Mining	Agricultural	Other	Total Consumption
1980	46	21	2	0	1	6	77
1981	43	18	1	0	1	2	65
1982	40	15	1	0	1	2	59
1983	33	16	1	0	1	2	52
1984	47	20	1	0	1	2	71
1985	59	22	1	1	1	2	84
1986	50	21	0	0	0	2	75
1987	62	16	0	0	0	1	81
1988	63	20	0	0	0	1	86
1989	69	19	1	1	1	1	91
1990	72	19	1	1	1	1	95
1991	61	24	1	1	1	1	88
1992	67	16	8	1	0	2	94
1993	72	17	10	1	0	3	102
1994	75	19	9	3	0	3	109
1995	71	14	11	4	0	2	103
1996	70	20	16	4	0	3	113
1997	76	21	17	4	0	3	121
1998	91	23	14	3	0	3	134
1999	86	22	17	4	0	3	132
2000	75	17	21	4	0	3	119
2001	78	20	15	2	0	2	117
2002	80	20	17	3	0	3	125
2003	84	20	19	4	0	3	130
2006	86	20	20	4	0	3	133
2007	87	20	20	4	0	3	134
2008	87	20	20	4	0	3	135
2009	88	20	21	4	0	3	136
2010	88	20	21	4	0	3	137
2011	89	20	21	4	0	3	138
2012	90	20	21	4	0	3	139
2013	90	20	22	4	0	3	140
2014	91	20	22	4	0	3	141
2015	92	20	22	4	0	3	141
2016	92	20	22	4	0	3	142

**Annual Growth Rates (%)**

1980-1990	4.6	-1.0	-9.1	6.6	-7.4	-15.1	2.1
1990-2000	0.4	-1.4	40.5	19.6	-11.5	9.1	2.3
2000-2001	3.2	18.7	-27.2	-35.3	-7.3	-24.9	-1.7
2000-2003	3.9	5.8	-3.2	2.3	1.3	4.7	3.0
2003-2008	0.7	0.4	1.7	-0.6	0.0	0.0	0.8
2008-2016	0.7	-0.2	1.1	2.0	0.0	0.0	0.7
2003-2016	0.7	0.0	1.4	1.0	0.0	0.0	0.7